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GLOBAL DATA MONITORING REPORT

November 2002

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background) field, although to provide background values valid at the observation time for non-main hour data, time-interpolation of the T+3, T+6 and T+9 forecasts is used; and for sea surface temperature the background field is the analysis from the previous day. Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. All data are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Bracknell and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: November 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times : All hours

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (Degrees).
:Sea surface temperature (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:PGE :Percentage of observations with gross errors.

:%REJ :Percentage of observations flagged excluding those with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)
:10 degrees (sea surface temperature)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction).
	≥ 3 degrees	(sea surface temperature).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
	≥ 5 degrees	(sea surface temperature).
3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE							
BBXX KS0	P	444	10	100	3.8	6.6	7.7
CAS2	P	25	4	100	1.6	-7.6	7.8
C6KD6	P	50	0	2	2.2	4.1	4.7
ELZF9	P	34	0	3	2.3	4.4	5.0
HODM	P	25	0	100	0.7	11.0	11.0
KCBH	P	33	0	73	4.4	-4.1	6.0
KS000	P	165	0	1	1.1	10.4	10.4
KS002	P	153	0	79	0.6	4.1	4.1
KS004	P	186	100	100			
KS006	P	142	0	0	0.7	7.0	7.1
KS025	P	189	0	0	0.7	8.4	8.4
LAOL	P	22	0	68	0.7	5.2	5.3
LAOL5	P	23	0	65	1.3	5.5	5.6
OUSE6	P	21	0	0	1.1	-5.5	5.6
PDGS	P	24	0	63	0.5	4.5	4.5
PJKO	P	22	14	45	4.0	-4.9	6.3
PJPO	P	56	0	14	0.9	4.1	4.1
SGIX	P	58	0	0	1.1	-4.0	4.2
UAMR	P	44	50	61	5.3	3.6	6.4
UHJU	P	25	12	36	6.1	2.4	6.6
VCLX	P	22	64	100	4.8	-6.5	8.1
V7BX2	P	32	3	6	2.0	-4.6	5.0
V7CY9	P	72	0	3	2.3	-5.4	5.9
3FMY7	P	37	30	38	1.3	2.6	2.9
3FOC5	P	33	0	88	2.0	5.4	5.8
31057	P	1211	11	82	5.4	5.0	7.3
48092	P	181	28	88	4.9	-8.6	9.9
62143	P	42	0	74	3.8	5.2	6.4
63108	P	116	0	88	2.5	9.7	10.0
8PNI	P	47	2	83	2.3	-5.3	5.8
WIND SPEED							
BBXX KS0	SPEED	299	0	100	2.0	-5.1	5.5
C6SN2	SPEED	54	0	33	5.3	6.0	8.0
DQVJ	SPEED	48	0	21	5.0	5.1	7.2
ELYB2	SPEED	21	10	100	3.1	5.5	6.3
ELYD5	SPEED	32	0	56	5.1	10.0	11.2
H3QM	SPEED	22	18	86	4.5	13.5	14.3
JKRK	SPEED	66	3	20	5.8	5.7	8.1
KS002	SPEED	152	0	1	2.1	-5.0	5.4
KS005	SPEED	107	0	100	2.3	-5.6	6.1
KS006	SPEED	139	0	100	1.4	-5.4	5.6
KS025	SPEED	113	0	100	2.2	-5.3	5.7
OUSE6	SPEED	20	0	100	5.5	13.3	14.4
OYVQ2	SPEED	30	13	27	5.1	5.1	7.3
OZQS2	SPEED	65	0	66	5.8	12.1	13.4
PJVQ	SPEED	34	0	21	5.8	5.3	7.8
VVKK	SPEED	44	0	14	4.8	5.5	7.3
V7AY2	SPEED	36	0	28	4.8	6.5	8.1
3FIG5	SPEED	30	7	20	3.4	5.7	6.6
3FZM	SPEED	42	0	100	3.6	-5.3	6.4
9WCY2	SPEED	64	0	48	6.9	5.9	9.1
WIND DIRECTION							
52315	DIRN.	21	0	0	105.2	-29.6	109.3
62414	DIRN.	49	0	0	48.6	-36.9	61.0

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
SEA SURFACE TEMPERATURE							
CGDS	SST	183	28	28	1.0	0.2	1.0
CGDX	SST	203	100	100			
CG8048	SST	63	100	100			
C6FN5	SST	34	59	62	1.8	-0.5	1.8
C6MS4	SST	34	0	100	1.4	-4.3	4.5
DBBX	SST	584	56	100	1.1	1.0	1.4
DBKV	SST	688	40	40	0.5	0.8	0.9
DGCP	SST	33	0	100	0.7	3.9	4.0
DGDO	SST	35	0	26	1.3	-3.1	3.3
DHMN	SST	33	0	9	0.7	3.2	3.2
ELWT7	SST	656	90	90	0.7	0.8	1.1
ELWY3	SST	20	0	25	1.0	3.4	3.6
ELXO4	SST	41	0	46	1.0	-3.9	4.0
ELYE8	SST	42	2	100	1.0	3.2	3.3
ELYS3	SST	24	29	33	1.6	1.8	2.4
ELZL3	SST	448	29	30	0.7	0.7	1.0
FNJI	SST	124	0	100	0.8	3.3	3.4
FNYF	SST	79	0	42	3.2	3.0	4.4
GNLB	SST	36	28	28	0.6	-0.2	0.6
H3QA	SST	85	0	100	0.9	-3.5	3.6
H9IM	SST	22	0	100	0.8	3.6	3.7
JKHH	SST	91	0	42	2.5	3.0	3.9
KRPB	SST	57	0	100	1.0	-3.8	3.9
KS008	SST	60	65	67	2.1	0.1	2.1
LARS5	SST	83	10	89	2.7	-7.2	7.7
MQKG7	SST	59	0	73	0.6	-4.2	4.2
OYVQ2	SST	26	4	69	2.3	4.4	5.0
S6TA	SST	34	9	41	2.5	-3.0	3.9
UBDP	SST	21	29	62	2.5	-3.8	4.6
UCBP	SST	56	0	100	1.1	-4.4	4.6
UCJB	SST	22	0	9	0.9	-3.0	3.2
UCJI	SST	22	5	41	2.0	-3.4	3.9
UCJL	SST	53	0	100	1.0	3.7	3.8
UCJO	SST	21	0	57	1.3	-4.0	4.2
UCNJ	SST	24	4	38	2.6	-3.2	4.1
UHJU	SST	28	0	50	1.8	-3.6	4.0
UHRT	SST	23	0	100	0.8	-3.6	3.7
VCLM	SST	366	55	100	0.9	1.1	1.4
VGLZ	SST	45	100	100			
VOCJ	SST	254	0	100	1.7	3.1	3.6
VRVP2	SST	22	0	0	0.7	3.1	3.2
V7AV6	SST	27	33	100	2.2	-1.5	2.7
WCW9126	SST	66	94	100	0.4	-0.5	0.6
WPVD	SST	123	1	72	0.8	3.2	3.3
WUW2120	SST	21	95	95	0.0	-2.6	2.6
WWU8	SST	22	100	100			
XYYY	SST	233	1	100	1.3	5.6	5.7
ZIQE8	SST	40	30	38	2.0	-2.1	2.9
ZMFR	SST	78	63	100	0.2	-8.8	8.8
3FHX8	SST	28	71	100	0.9	-5.8	5.8
45147	SST	600	100	100			
46131	SST	713	100	100			
46146	SST	714	100	100			
46181	SST	716	100	100			
62092	SST	41	29	49	3.8	0.2	3.9

Figure 1. SHIP/SYNOP mean daily count. NOVEMBER 2002
All hours
Global average number of observations in 24 hours = 20985

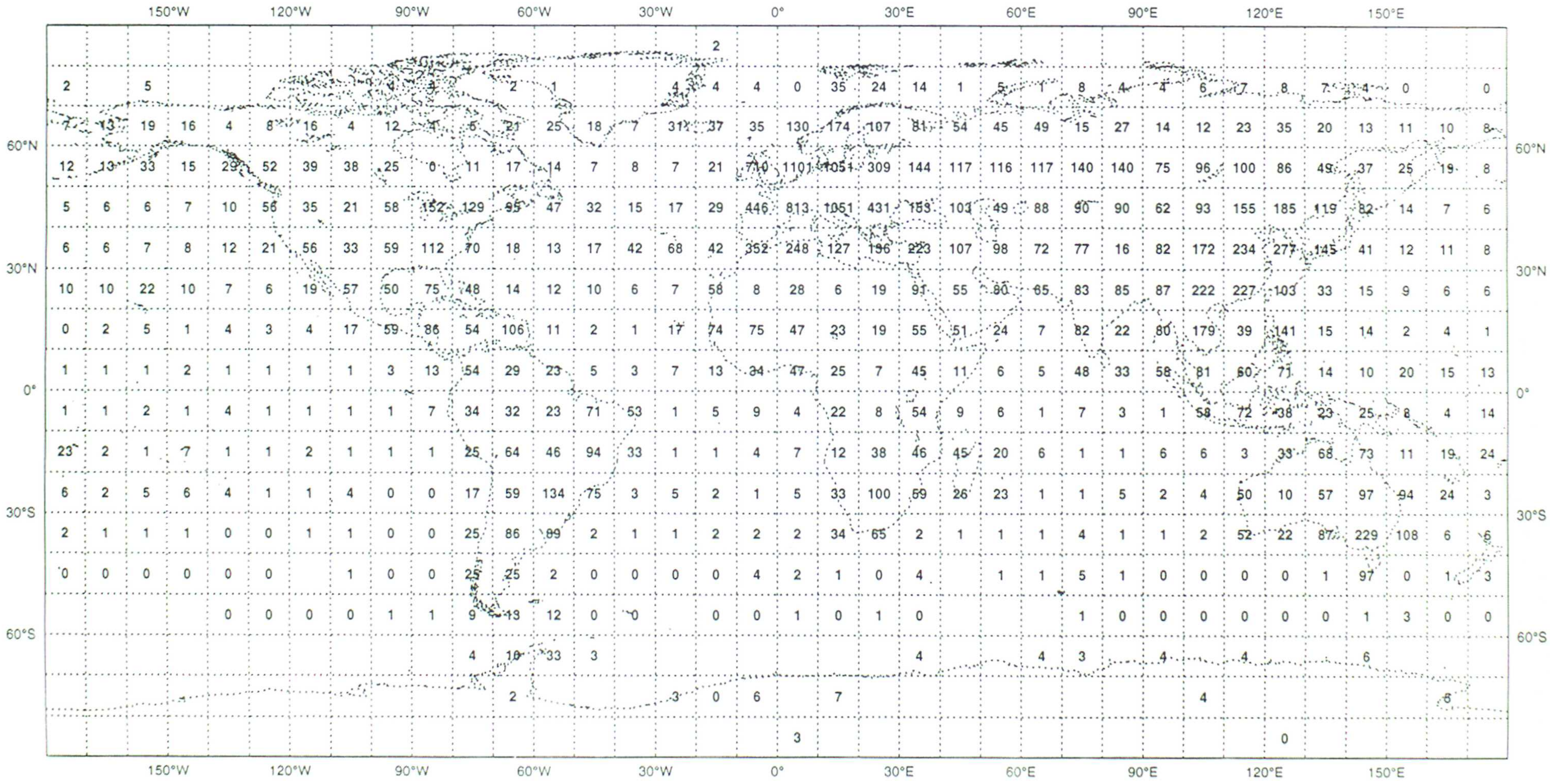

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
2
2 5 4 3 2 1 4 4 4 0 35 24 14 1 5 1 8 4 4 6 7 8 7 4 0 0
7 13 19 16 4 8 16 4 12 4 5 21 25 18 7 31 37 35 130 174 107 81 54 45 49 15 27 14 12 23 35 20 13 11 10 8
12 13 33 15 29 52 39 38 25 0 11 17 14 7 8 7 21 710 1101 1051 309 144 117 116 117 140 140 75 96 100 86 49 37 25 19 8
5 6 6 7 10 56 35 21 58 152 129 95 47 32 15 17 29 446 813 1051 431 153 103 49 88 90 90 62 93 155 185 119 82 14 7 6
6 6 7 8 12 21 56 33 59 112 70 18 13 17 42 68 42 352 248 127 196 223 107 98 72 77 16 82 172 234 277 145 41 12 11 8
10 10 22 10 7 6 19 57 50 75 48 14 12 10 6 7 58 8 28 6 19 91 55 80 65 83 85 87 222 227 103 33 15 9 6 6
0 2 5 1 4 3 4 17 59 86 54 106 11 2 1 17 74 75 47 23 19 55 51 24 7 82 22 80 179 39 141 15 14 2 4 1
1 1 1 2 1 1 1 1 3 13 54 29 23 5 3 7 13 34 47 25 7 45 11 6 5 48 33 58 81 60 71 14 10 20 15 13
1 1 2 1 4 1 1 1 1 7 34 32 23 71 53 1 5 9 4 22 8 54 9 6 1 7 3 1 58 72 38 23 25 8 4 14
23 2 1 7 1 1 2 1 1 1 25 64 46 94 33 1 1 4 7 12 38 46 45 20 6 1 1 6 6 3 33 68 73 11 19 24
6 2 5 6 4 1 1 4 0 0 17 59 134 75 3 5 2 1 5 33 100 59 26 23 1 1 5 2 4 50 10 57 97 94 24 3
2 1 1 1 0 0 1 1 0 0 25 86 89 2 1 1 2 2 2 34 65 2 1 1 1 4 1 1 2 52 22 87 229 108 6 6
0 0 0 0 0 0 1 0 0 25 25 2 0 0 0 0 4 2 1 0 4 1 1 5 1 0 0 0 0 1 97 0 1 3
0 0 0 0 1 1 9 13 12 0 0 0 0 1 0 1 0 1 0 0 0 0 0 0 1 3 0 0
4 10 33 3 4 4 3 4 4 6
2 3 0 6 7 4 6
3 0

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: November 2002

Monitoring procedures

Period		:One calendar month.	
Data monitored		:Reports from each unique identifier for drifting buoys.	
Standard of comparison		:Background field from UKMO global model.	
Position		:Average latitude and longitude for period.	
Observation times		: All hours	
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees). :Sea surface temperature (degrees).	
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.	
	:PGE	:Percentage of observations with gross errors.	
	:%REJ	: Percentage of observations flagged excluding those with gross errors	
	:SD	:SD of difference of observations from background values excluding those with gross errors.	
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the wind observation is veered to the background.**	
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.	
GROSS ERROR LIMIT	:15 hPa	(pressure)	
	:25 m s^{-1}	(vector wind)	
	:10 degrees	(sea surface temperature)	
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:	
	1.|bias|	≥ 4 hPa	(pressure),
		≥ 5 m s^{-1}	(wind speed),
		≥ 30 degrees	(direction).
		≥ 3 degrees	(sea surface temperature).
	2.SD	≥ 6 hPa	(pressure),
		≥ 80 degrees	(direction).
		≥ 5 degrees	(sea surface temperature).
	3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
16951	-44.7	52.1	P	460	0	59	3.1	4.3	5.3
17515	-45.0	-8.7	P	102	11	60	3.7	6.7	7.6
21530	44.3	145.3	P	87	39	82	4.3	5.3	6.9
23648	9.2	92.0	P	150	55	76	4.4	-3.9	5.9
25571	86.5	179.8	P	229	68	100	4.3	-7.1	8.3
41536	20.2	-71.3	P	607	84	87	5.5	3.5	6.5
44504	50.8	-41.1	P	483	61	91	8.4	0.1	8.4
44624	39.4	-14.0	P	86	23	99	1.8	-9.8	10.0
48574	75.6	-129.7	P	521	47	100	9.2	1.1	9.2
61532	41.1	30.0	P	106	100	100			
WIND SPEED									
52529	24.1	140.2	SPEED	335	0	100	3.0	-5.0	5.8
52537	28.9	137.9	SPEED	598	0	100	3.5	-5.0	6.1
52648	17.1	143.1	SPEED	478	2	100	5.9	7.0	9.2
WIND DIRECTION									
21535	26.4	149.2	DIRN.	324	1	0	22.7	-37.8	44.1
23594	18.5	91.2	DIRN.	106	0	0	38.7	104.4	111.3
23924	10.9	85.7	DIRN.	119	0	0	42.7	78.4	89.2
41536	20.2	-71.3	DIRN.	88	30	0	38.3	77.4	86.3
41648	26.8	-72.4	DIRN.	414	1	0	34.0	55.3	65.0
SEA SURFACE TEMPERATURE									
21530	44.3	145.3	SST	89	0	79	2.1	4.8	5.2
21534	41.2	137.4	SST	38	100	100			
22903	37.6	138.7	SST	86	36	88	3.2	-5.1	6.0
23510	5.8	73.0	SST	38	100	100			
32526	3.6	-88.6	SST	213	100	100			
32537	-14.6	-115.3	SST	37	0	59	3.5	-4.3	5.6
32907	8.4	-79.3	SST	187	100	100			
33502	-28.6	-11.3	SST	106	0	100	1.2	3.3	3.5
44504	50.8	-41.1	SST	492	2	100	0.6	7.5	7.5
44607	41.4	-41.6	SST	840	0	100	0.9	3.5	3.6
44772	61.3	-31.4	SST	466	0	100	0.6	5.7	5.7
46972	18.0	-133.1	SST	197	0	100	0.5	3.8	3.9
51645	-18.5	-165.9	SST	258	9	70	3.8	4.9	6.3
51907	-6.6	-149.8	SST	113	100	100			
51909	-4.1	-149.0	SST	225	36	42	0.1	0.4	0.4
52521	15.2	137.3	SST	470	0	97	0.5	3.3	3.3
55905	-54.7	-108.2	SST	417	0	100	0.3	3.3	3.3
64606	64.4	-35.2	SST	191	0	74	1.8	4.0	4.4

Figure 2. DRIFTER mean daily count. NOVEMBER 2002
All hours
Global average number of observations in 24 hours = 8233

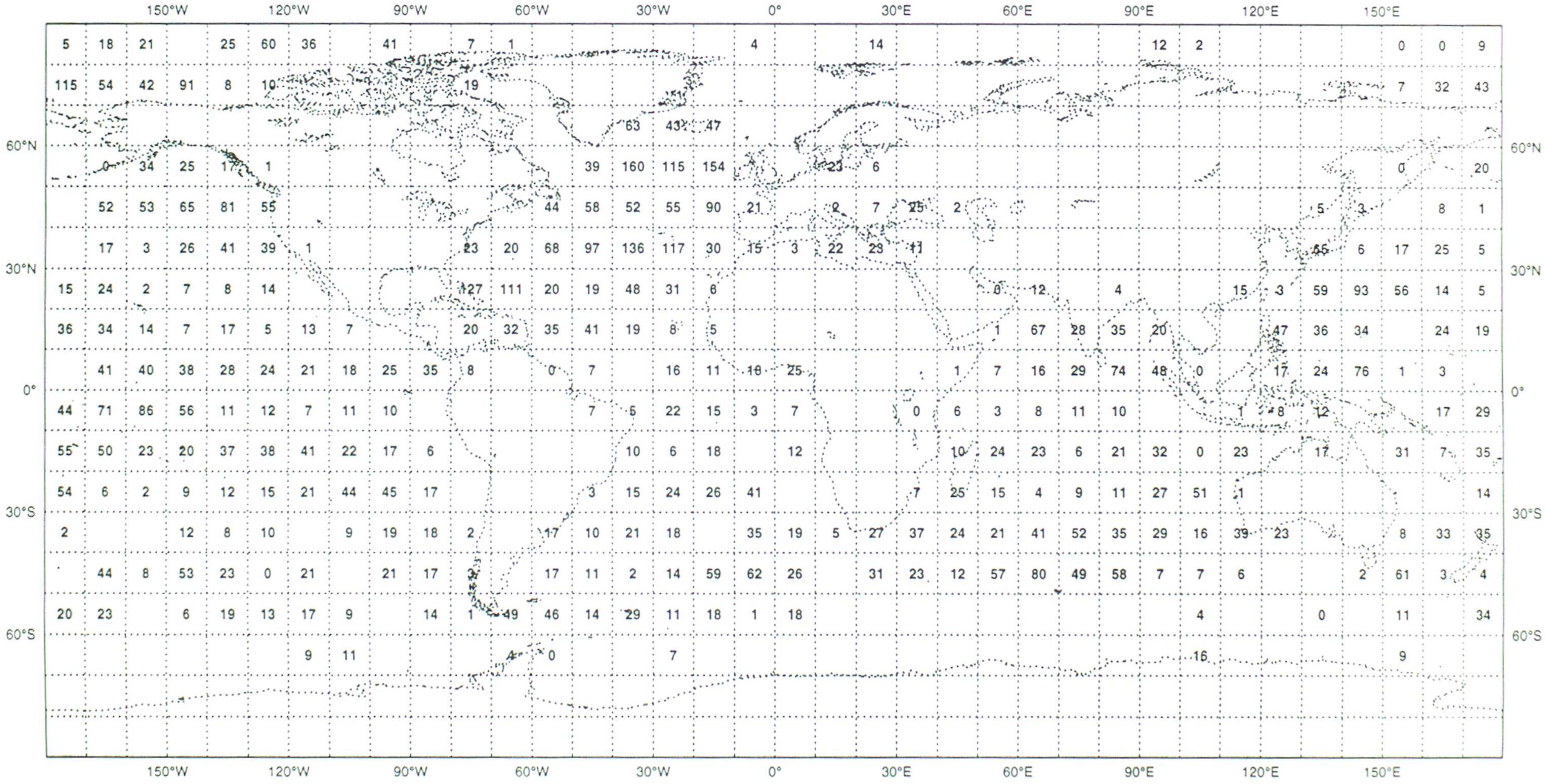

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
5 18 21 25 60 36 41 7 1 4 14 12 2 0 0 9
115 54 42 91 8 10 19 7 32 43
63 43 47
0 34 25 17 1 39 160 115 154 23 6 0 20
52 53 65 81 55 44 58 52 55 90 21 2 7 25 2 5 3 8 1
17 3 26 41 39 1 23 20 68 97 136 117 30 15 3 22 23 11 55 6 17 25 5
15 24 2 7 8 14 127 111 20 19 48 31 8 0 12 4 15 3 59 93 56 14 5
36 34 14 7 17 5 13 7 20 32 35 41 19 8 5 1 67 28 35 20 47 36 34 24 19
41 40 38 28 24 21 18 25 35 8 0 7 16 11 18 25 1 7 16 29 74 48 0 17 24 76 1 3
44 71 86 56 11 12 7 11 10 7 5 22 15 3 7 0 6 3 8 11 10 1 8 12 17 29
55 50 23 20 37 38 41 22 17 6 10 6 18 12 10 24 23 6 21 32 0 23 17 31 7 35
54 6 2 9 12 15 21 44 45 17 3 15 24 26 41 7 25 15 4 9 11 27 51 1 14
2 12 8 10 9 19 18 2 17 10 21 18 35 19 5 27 37 24 21 41 52 35 29 16 39 23 8 33 35
44 8 53 23 0 21 21 17 17 11 2 14 59 62 26 31 23 12 57 80 49 58 7 7 6 2 61 3 4
20 23 6 19 13 17 9 14 1 49 46 14 29 11 18 1 18 4 0 11 34
9 11 4 0 7 16 9
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: November 2002

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60728	36.4N	10.7E	1	MS	52	1	2	4	1.1	-8.3	8.4
62790	12.1N	24.9E	674	MS	68	1	1	1	0.8	4.2	4.3
63330	13.5N	39.5E	2070	MS	22	22	100	0			
63333	11.1N	39.7E	1903	MS	22	0	0	0	0.6	5.9	5.9
63334	10.3N	37.7E	2515	MS	23	0	0	0	0.6	10.8	10.8
63402	7.7N	36.8E	1725	S	22	1	5	5	2.4	7.8	8.2
63450	9.0N	38.8E	2354	MS	23	0	0	0	0.7	4.9	4.9
63453	8.9N	39.9E	930	S	23	0	0	0	0.9	-4.6	4.7
63471	9.6N	41.9E	1260	MS	23	0	0	0	1.1	10.4	10.5
63478	5.9N	43.6E	295	MS	24	0	0	0	0.9	5.4	5.5
63680	0.3N	32.6E	1144	S	21	0	0	5	1.5	-5.7	5.9
63801	4.9S	29.6E	882	S8	105	0	0	0	1.0	8.2	8.3
65355	9.8N	1.1E	342	MS	104	0	0	1	2.1	-12.9	13.1
67308	22.1S	31.7E	452	M	20	20	100	0			
68014	19.6S	18.1E	1411	S8	54	0	0	0	0.8	-4.4	4.5
68030	18.5S	25.6E	1071	8	86	0	0	0	0.9	5.2	5.3
68038	20.5S	26.0E	903	8	65	0	0	3	1.0	4.2	4.3
68312	26.5S	18.1E	1067	S8	55	0	0	16	0.8	6.1	6.2
68338	26.9S	24.6E	1234	S8	52	52	100	0			
68396	26.5S	31.3E	641	S8	55	1	2	4	1.2	4.5	4.7
68575	30.0S	30.0E	1175	S8	92	92	100	0			
68668	31.5S	28.7E	743	S8	90	28	31	0	0.8	0.6	1.0
68754	32.5S	27.5E	899	S8	83	37	45	0	0.8	-0.4	0.9

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
24671	63.9N	135.9E	402	MS	117	0	0	40	4.0	5.2	6.6
24688	63.3N	143.2E	741	MS	118	8	7	0	5.1	4.9	7.1
30554	54.5N	113.6E	995	MS	117	0	0	0	4.1	6.5	7.7
30967	49.9N	115.8E	623	MS	87	0	0	2	2.0	-7.3	7.6
31123	57.8N	130.9E	255	MS	115	4	3	0	2.9	4.1	5.0
36020	52.5N	80.2E	59	MS	24	0	0	50	6.6	-7.0	9.6
36982	41.9N	78.2E	3635	S	118	3	3	2	1.1	6.0	6.1
40700	39.6N	47.9E	45	MS	53	0	0	2	1.6	-6.3	6.5
40713	37.4N	46.3E	1475	MS	51	26	51	2	0.8	14.3	14.3
40741	36.5N	61.2E	235	MS	44	1	2	0	0.8	-5.5	5.6
40757	35.6N	53.4E	1171	S	39	0	0	0	1.1	4.5	4.6
41254	23.1N	57.6E	1755	S8	82	82	100	0			
41314	17.7N	54.0E	467	MS	112	0	0	0	0.6	4.0	4.0
41396	16.0N	48.9E	700	MS	59	0	0	2	1.4	6.1	6.3
41466	13.7N	44.1E	1402	8	26	0	0	8	1.6	-5.3	5.5
43415	8.8N	80.5E	98	S	62	60	97	0	0.4	11.8	11.8
44265	46.1N	91.5E	1186	MS	110	2	2	10	2.0	5.2	5.6
44304	47.3N	110.6E	1035	MS	115	1	1	2	1.7	-5.9	6.1
44416	28.6N	81.6E	720	MS	60	0	0	0	0.7	4.3	4.4
47022	40.8N	128.2E	1224	S	88	1	1	2	1.0	4.4	4.5
48924	21.1N	101.5E	644	M	32	0	0	0	1.0	10.8	10.8
48925	20.7N	102.0E	550	M	50	28	56	18	1.0	-13.4	13.4
48935	19.5N	103.1E	1050	8	52	0	0	0	0.8	-8.7	8.7
51495	43.2N	91.7E	874	M	117	0	0	0	1.3	7.5	7.6
52866	36.6N	101.8E	2262	S	117	0	0	0	1.0	-4.9	5.0
52955	35.6N	100.8E	3123	S	118	0	0	87	1.5	4.9	5.1
53083	44.6N	114.2E	1183	M	117	0	0	45	2.3	4.7	5.2
56462	29.0N	101.5E	2994	S	118	0	0	0	1.5	8.5	8.6
57816	26.6N	106.7E	1074	MS	117	114	97	0	0.1	-14.7	14.7

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	38	0	0	0	1.2	-7.4	7.5
82181	2.0S	54.1W	146	MS	84	0	0	0	0.9	6.6	6.7
82445	4.3S	55.6W	45	MS	87	0	0	1	1.5	4.0	4.3
82765	7.3S	47.5W	193	MS	85	0	0	0	0.8	4.6	4.7
83235	12.4S	46.4W	604	MS	87	0	0	1	1.1	6.6	6.7
83319	14.7S	52.4W	315	MS	86	0	0	0	1.3	4.5	4.7
83332	14.1S	46.4W	826	MS	87	47	54	0	0.3	14.5	14.5
83470	17.9S	50.9W	727	MS	88	0	0	83	1.1	-4.2	4.3
83531	18.6S	46.5W	940	MS	86	0	0	0	0.7	-6.0	6.0
83630	20.6S	47.4W	1026	MS	87	0	0	1	0.9	4.0	4.1
83836	25.5S	50.6W	837	MS	88	0	0	1	1.4	-5.3	5.5
84377	3.8S	73.3W	125	M	95	0	0	0	1.0	4.1	4.2
84401	5.2S	80.6W	49	S	97	0	0	1	1.5	4.4	4.6
84425	5.9S	76.1W	179	MS	69	0	0	0	1.1	4.4	4.5
84455	6.5S	76.4W	281	MS	68	0	0	0	1.4	7.1	7.2
84472	7.1S	78.5W	2620	S	47	0	0	0	0.8	-5.7	5.8
84474	7.2S	76.7W	350	S	20	0	0	0	1.2	9.6	9.7
84686	13.6S	72.0W	3248	S	96	0	0	0	0.8	-5.2	5.3
84688	13.7S	73.4W	3444	S	44	0	0	0	0.5	-12.9	12.9
84720	14.9S	75.0W	567	MS	46	1	2	0	1.0	4.7	4.8
84782	18.1S	70.3W	468	MS	79	0	0	0	1.2	8.3	8.4
85264	18.5S	64.1W	1998	S	56	56	100	0			
85312	19.8S	63.9W	992	S	47	17	36	17	1.7	-12.5	12.6
85406	18.3S	70.3W	55	M	117	0	0	0	0.9	4.7	4.8
85432	22.5S	68.9W	2320	S8	79	0	0	0	0.6	5.6	5.6
87904	60.3S	72.1W	199	MS	115	51	44	64	4.8	7.8	9.2

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71048	61.6N	125.8W	610	MS	116	0	0	20	1.8	7.1	7.3
71049	66.0N	91.8W	150	MS	117	77	66	0	0.9	14.0	14.0
71181	47.1N	55.3W	29	MS	116	0	0	16	0.9	-6.2	6.3
71475	49.3N	124.8W	2	MS	117	0	0	87	1.0	-7.3	7.4
71506	67.0N	136.2W	720	MS	118	0	0	19	2.2	-5.2	5.6
71599	44.4N	65.2W	127	MS	115	0	0	35	0.9	-4.2	4.3
72327	36.1N	86.7W	182	MS	118	0	0	0	0.6	4.1	4.1
72375	34.6N	111.2W	2291	MS	117	99	85	0	0.4	14.4	14.4
72376	35.2N	111.8W	2179	M	116	0	0	20	3.6	5.6	6.7
72475	38.4N	113.0W	1536	M	117	0	0	9	3.0	4.0	5.0
76055	31.0N	114.9W	440	MS	25	25	100	0			
76118	30.4N	109.7W	1041	MS	27	0	0	4	2.1	-10.5	10.7
76243	28.7N	100.5W	250	MS	103	0	0	3	1.8	5.8	6.1
76491	23.8N	99.1W	355	MS	91	0	0	0	1.3	4.0	4.2
76543	22.0N	98.8W	104	MS	26	0	0	0	0.9	7.8	7.9
76683	19.3N	98.3W	2248	MS	94	0	0	0	0.8	4.1	4.2
76743	18.0N	92.9W	16	MS	82	0	0	0	0.7	6.0	6.0
76762	17.5N	99.5W	1265	MS	69	0	0	0	1.0	5.7	5.8
76773	17.8N	97.8W	1650	MS	27	0	0	0	1.2	4.1	4.3
76903	14.9N	92.3W	118	MS	98	0	0	0	0.7	5.8	5.8

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
92010	6.1S	145.4E	1587	M	33	0	0	0	0.6	9.1	9.1
94130	14.8S	131.9E	120	MS	117	0	0	0	1.3	5.4	5.6
95541	29.8S	151.1E	582	MS	87	0	0	0	0.7	-5.3	5.3
97378	10.7S	123.1E	1	MS	40	39	98	0	0.0	-14.7	14.7

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
06605	47.1N	7.1E	1599	S8	115	0	0	0	0.9	-4.1	4.2
06685	47.0N	9.1E	515	MS	115	0	0	9	1.4	6.8	6.9
08912	42.9N	0.8W	1434	MS	335	335	100	0			
08922	42.8N	0.2W	1660	MS	319	319	100	0			
10850	48.8N	10.7E	457	MS	261	0	0	26	2.3	-4.2	4.8
13269	44.3N	19.9E	176	MS	111	0	0	0	0.8	7.4	7.4
14554	44.9N	18.4E	136	S	57	7	12	0	1.0	-13.7	13.7
16344	39.3N	16.4E	1710	S8	83	0	0	46	1.6	4.1	4.4
16538	40.1N	9.3E	1022	S	35	0	0	100	0.9	9.7	9.7
17203	38.9N	40.5E	1177	S8	117	0	0	0	1.0	6.4	6.5

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	113	0	0	0	1.2	-6.9	7.0
89253	63.2S	55.4W	75	M	235	0	0	0	1.4	4.4	4.6
89257	75.4S	59.9W	40	S	801	0	0	0	1.2	-4.4	4.6
89263	66.0S	66.1W	20	M	235	7	3	0	6.2	6.2	8.8
89264	71.4S	68.9W	780	S	94	0	0	0	0.9	7.8	7.9
89266	72.2S	60.2W	91	S	217	209	96	0	10.5	-1.7	10.6
89272	75.0S	70.8W	1395	S	231	231	100	0			
89637	69.5S	130.0E	2560	S	281	23	8	0	1.7	12.9	13.0
89744	74.0S	43.1E	3353	S	256	0	0	0	0.6	7.6	7.6

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: November 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	3077	1	38	1.4	0.2	3054	0	37	0	6.7	0.5
AAL	6176	0	37	1.3	0.1	5966	0	39	0	7.0	0.4
AAR	1336	1	6	1.8	-0.6	1315	1	8	0	9.3	0.2
ACA	3120	1	14	1.6	0.0	2868	0	15	0	7.7	0.3
ACI	36	0	64	0.9	-0.1	35	0	63	0	6.6	-1.2
AEA	1017	0	2	1.5	0.5	519	0	3	0	7.6	0.7
AEL	411	0	8	1.5	-0.4	332	0	8	0	8.6	-0.2
AFL	487	1	4	1.9	0.4	419	0	3	0	7.2	0.7
AFR	1913	1	6	1.4	0.3	1503	0	7	0	7.9	0.3
AIS	275	0	8	1.7	-0.5	252	1	10	0	7.0	0.7
AJM	406	0	2	1.4	-0.1	336	0	4	0	8.3	0.5
AJX	253	0	9	1.7	0.8	253	0	9	0	7.9	0.6
AMM	129	0	3	1.6	0.5	94	0	3	0	7.3	1.2
AMT	1274	0	44	1.3	0.4	1271	0	44	0	5.8	0.2
AMX	351	1	4	1.4	0.1	238	0	9	0	12.8	-0.5
ANA	377	1	8	1.9	0.8	378	1	8	0	8.3	0.5
ANZ	4860	0	33	1.3	0.2	4831	0	33	0	7.0	0.4
ARG	30	3	30	2.3	0.2	25	0	28	0	6.9	1.0
ATN	117	1	41	3.4	-0.9	117	0	31	0	9.9	0.9
AVA	305	0	2	1.8	1.0	176	0	2	0	7.2	0.1
AVN	148	1	49	1.0	0.3	146	1	49	0	6.1	-0.3
AXF	28	0	32	1.0	0.2	28	0	32	0	4.4	0.0
AZA	533	1	18	2.3	0.5	463	0	4	0	8.1	0.5
BAL	207	0	7	1.6	-0.1	167	2	13	0	9.4	0.2
BAW	766	0	5	1.5	-0.2	681	0	6	0	7.8	0.4
BBR	188	3	6	1.5	0.7	111	0	7	0	11.0	1.8
BHP	30	0	3	2.1	-0.1	29	0	0	0	5.0	1.4
BOE	23	9	35	1.2	0.2	23	0	30	0	6.9	1.8
BSK	42	0	12	1.9	0.5	38	0	16	0	10.5	2.6
BWA	327	2	7	1.5	0.4	231	0	6	0	7.5	1.3
CAL	95	1	11	2.4	-0.1	99	0	9	0	8.9	-0.4
CCA	310	3	18	2.7	0.5	336	2	100	0	13.4	0.5
CES	367	1	10	1.9	0.4	383	2	12	0	9.7	0.2
CFG	1007	1	5	1.5	-0.5	824	0	6	0	7.3	0.1
CGA	60	0	0	1.4	-0.5	55	0	0	0	5.4	1.0
CGH	81	0	2	1.1	-0.4	74	0	3	0	3.9	0.4
CKS	286	0	100	2.3	1.9	285	0	42	0	6.5	0.9
CLX	413	1	5	1.4	-0.5	320	0	7	0	7.1	-0.4
CMI	127	0	23	1.2	0.0	131	0	24	0	7.5	1.6
COA	743	1	42	1.6	-0.3	682	0	44	0	7.2	0.7
CPA	82	0	6	1.3	0.4	83	0	6	0	5.2	0.9
CRL	374	1	7	1.3	0.3	272	0	10	0	8.6	0.6
CSN	192	2	13	2.2	-0.2	191	1	14	0	10.9	0.7
CUB	313	0	17	2.3	1.3	237	0	7	0	8.6	0.3
DAB	158	0	8	1.3	-0.3	143	0	8	0	4.7	0.4
DAI	120	0	1	1.3	-0.1	116	0	1	0	5.0	0.4
DAL	2825	0	41	1.4	-0.1	2725	0	43	0	7.1	0.3
DBR	41	2	7	2.1	-0.1	41	0	2	0	7.4	1.0
DCE	98	1	6	1.0	0.1	84	0	7	0	7.3	1.8
DCS	32	0	3	2.0	0.1	35	0	0	0	7.7	1.6
DHL	109	2	100	6.7	-6.1	104	1	21	0	12.7	3.3
DLH	1451	0	13	1.5	0.0	1335	0	15	0	7.9	0.7
EDW	97	1	3	0.9	-0.1	80	0	6	0	9.6	-1.1
EIA	245	1	39	3.7	1.9	239	1	100	0	15.0	3.3
ELY	175	1	4	1.8	-0.2	157	1	5	0	7.4	0.6
ETH	20	0	5	1.3	-0.1	23	0	9	0	9.8	0.1
EVA	175	0	18	1.6	-0.5	174	0	19	0	7.5	-0.4
EWW	59	0	7	1.8	0.3	61	0	7	0	9.8	-0.3
FDX	2171	0	43	1.4	0.4	2172	0	43	0	7.4	0.5

		TEMPERATURE				WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
FGS	149	0	1	1.3	0.4	140	0	1	0	4.4	0.4
FGZ	44	0	0	1.3	-0.2	43	0	0	0	5.1	0.2
FIN	212	0	5	1.5	0.2	193	1	6	0	10.2	0.5
FJI	1126	2	66	1.5	0.3	1103	0	66	0	8.9	-0.3
FOM	685	1	33	1.5	0.2	679	0	32	0	7.2	0.8
FWQ	50	0	50	1.0	-0.5	50	0	50	0	6.0	-0.9
GCO	516	0	19	1.6	0.0	518	0	22	0	10.5	2.0
GHA	81	1	9	1.8	-0.7	56	0	5	0	9.7	1.9
GOJ	33	0	0	1.2	0.0	33	0	0	0	5.3	1.9
GRL	42	0	0	1.7	-0.4	41	0	0	0	4.0	0.4
GTI	311	0	11	1.7	0.0	312	1	11	0	7.4	0.2
GVF	27	0	0	1.0	-0.3	24	0	0	0	4.9	0.9
GVG	20	0	0	1.2	0.0	20	0	0	0	5.3	0.3
GVH	24	0	0	1.1	-0.5	23	0	0	0	6.1	2.4
GVL	22	0	0	1.2	0.1	20	0	0	0	5.4	0.0
GVR	68	0	1	1.3	0.1	60	0	0	0	5.6	-0.5
GWW	63	0	2	1.5	-0.7	55	0	0	0	5.0	1.3
HAL	5102	0	40	1.3	-0.2	5069	0	41	0	7.9	0.7
IBE	3059	0	4	1.5	0.4	1800	0	6	0	7.8	0.7
ICE	709	0	3	1.6	-0.2	722	1	7	0	10.0	0.8
IWD	247	0	5	1.1	-0.1	174	1	7	0	8.4	2.3
JAA	153	1	3	1.9	1.2	153	0	3	0	6.8	3.1
JAL	2665	0	5	1.7	0.4	2657	0	6	0	7.9	0.3
JAZ	1053	0	6	1.5	0.8	1046	1	7	0	7.8	0.9
JBU	25	0	0	0.7	0.0	26	0	0	0	4.9	0.9
JMC	136	1	3	1.5	0.3	112	0	4	0	8.0	1.3
KAL	3195	1	12	1.8	-0.1	3193	1	13	0	8.5	0.4
KLM	1977	0	6	1.6	0.2	1582	0	7	0	7.2	0.4
LAN	497	0	4	1.8	-0.3	490	0	5	0	6.2	1.5
LAP	50	2	14	2.3	1.1	49	0	10	0	11.8	2.2
LDI	454	0	11	1.4	-0.4	308	0	2	0	6.9	0.8
LIB	573	1	5	1.9	1.3	381	0	6	0	9.2	1.3
LOT	49	0	0	1.3	-0.8	49	0	0	0	5.4	0.2
LTU	739	1	5	1.5	0.1	562	0	6	0	7.6	1.0
MAS	277	1	6	1.6	0.1	279	1	7	0	9.4	0.1
MON	87	0	6	1.7	-0.1	63	0	5	0	7.4	1.2
MPD	278	1	5	1.7	0.7	180	1	7	0	8.6	0.2
MPH	678	0	3	1.5	-0.6	609	0	4	0	7.7	-0.1
MYT	205	1	5	1.6	0.1	175	0	3	0	7.5	-0.2
NCA	1022	0	4	1.8	0.1	778	0	5	0	7.8	-0.1
NGA	50	2	6	1.2	0.3	36	0	8	0	13.4	-0.6
NWA	9359	1	10	1.7	0.3	9275	0	10	0	8.2	0.2
NZL	3325	0	12	1.3	0.2	3325	0	12	0	5.4	0.7
OAE	256	0	37	1.2	-0.1	259	0	37	0	7.2	0.4
PAC	900	1	22	1.8	0.3	911	0	22	0	8.6	0.1
PAL	1276	0	11	1.6	-0.3	1197	0	12	0	8.9	0.1
PAO	376	0	65	1.7	1.0	375	0	66	0	8.6	1.6
QFA	2553	0	52	1.5	0.4	2546	0	52	0	6.2	0.4
RAM	202	1	7	1.8	0.2	100	3	11	0	12.6	-0.6
RCH	303	1	100	2.6	-0.1	257	1	88	0	13.7	2.4
RJA	65	0	2	1.5	-0.4	66	0	3	0	6.6	1.1
RON	34	0	35	0.8	0.2	34	0	35	0	5.9	1.0
RRR	82	0	17	2.6	0.8	75	0	20	0	11.3	1.2
RYN	145	0	100	2.6	-0.5	143	0	44	0	6.3	0.4
RZO	315	0	3	1.7	-0.3	126	0	5	0	8.5	-0.3
SAA	322	1	2	1.5	-0.7	260	0	4	0	8.0	0.6
SHE	22	0	0	1.6	1.3	20	0	0	0	7.2	1.0
SIA	248	0	6	1.3	0.3	246	0	6	0	5.2	-0.1
SLR	181	2	8	1.2	0.2	166	1	7	0	6.6	0.3

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
SOO	42	0	14	2.4	0.0	69	1	12	0	9.0	-0.7
SQC	53	0	4	1.6	0.0	53	0	4	0	5.8	0.5
SVA	40	0	3	1.1	-0.3	42	5	12	0	12.2	0.2
TAG	50	0	8	1.2	0.3	44	0	11	0	8.8	0.2
TAM	25	8	20	1.6	1.0	25	0	16	0	7.5	1.0
TAP	652	1	4	1.5	-0.3	280	0	6	0	8.0	0.3
TCV	31	0	0	1.4	0.7	24	0	0	0	6.4	1.4
THA	111	0	5	1.8	-0.5	111	0	4	0	6.2	0.3
THT	132	0	35	1.5	0.3	128	2	36	0	9.5	0.8
TPA	51	0	0	1.1	0.6	44	2	2	0	5.9	-1.1
TSC	29	0	7	2.2	0.1	26	0	0	0	5.3	1.0
UAL	227230	0	95	1.2	-0.3	227310	0	95	0	5.1	0.5
UPS	1944	0	54	2.0	0.5	1877	0	53	0	7.7	0.5
USA	215	1	3	1.4	0.0	189	1	3	0	8.9	0.8
VIR	275	0	5	1.6	-0.3	251	0	4	0	6.7	0.5
VPB	23	0	4	1.9	1.0	20	0	5	0	5.6	-1.2
VRG	165	3	13	2.1	0.5	166	1	14	0	10.0	0.4
VVR	52	4	25	3.1	1.4	46	0	13	0	6.4	-0.8
WOA	274	2	13	2.2	0.3	277	1	15	0	10.0	0.8
YSS	93	0	4	1.3	0.8	64	0	8	0	8.2	1.4
9VS	100	0	4	1.3	0.1	98	0	3	0	5.7	-0.2
AR	1845	0	100	3.0	2.8	1836	0	4	0	6.3	1.3
AU	41238	0	14	1.2	0.5	41362	0	14	0	5.2	0.4
EU	132090	0	24	1.3	0.1	132090	0	24	0	4.9	0.5
KL	2000	0	13	1.3	0.6	1994	0	13	0	5.4	0.6
LH	1955	0	9	1.7	1.2	1954	0	8	0	5.2	0.7
MK	3889	0	15	2.2	1.9	3875	0	7	0	6.8	1.5
SA	4636	0	44	1.8	1.3	4636	0	9	0	6.3	0.7
TN	62	0	24	2.2	0.2	60	0	25	0	9.8	0.3
N	1903	1	17	1.8	0.0	1846	0	18	0	6.6	1.1
US ACARS	983821	1	62	1.4	0.3	983780	0	61	0	5.4	0.6

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: November 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :1000.0 – 300.1 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	347	1	40	1.3	-0.3	338	0	41	0	6.1	1.1
AAR	21	0	19	1.7	-1.3	22	0	23	0	9.1	-1.1
ACA	46	2	24	1.4	-0.1	44	0	25	0	11.3	0.7
ACI	21	0	86	0.9	-0.1	21	0	86	0	7.0	5.2
AFR	105	1	4	1.5	0.2	93	0	3	0	5.6	0.6
AMT	20	0	40	1.6	0.4	20	0	40	0	4.4	-0.8
ANZ	209	2	33	1.1	0.0	207	0	32	0	5.0	0.0
ATN	54	0	43	4.4	-3.1	52	0	27	0	12.6	7.0
AXF	38	8	68	0.8	0.2	38	0	66	0	5.7	1.6
AZA	24	4	17	1.5	0.3	21	0	10	0	8.6	-0.9
BAW	28	0	21	1.3	-0.5	26	0	15	0	5.4	1.8
CES	20	5	50	1.7	0.6	20	0	50	0	11.7	2.9
CFC	67	0	3	1.7	0.9	60	0	7	0	8.6	0.1
CMI	22	0	14	2.0	-1.0	22	0	9	0	5.6	1.2
COA	37	0	46	1.4	0.0	37	0	49	0	11.8	0.6
CUB	42	0	12	1.4	0.7	24	0	4	0	9.1	2.8
DAL	223	0	47	1.3	-0.3	212	0	48	0	6.2	0.9
DLH	258	0	10	1.2	0.0	255	0	12	0	7.1	1.1
EVA	20	0	35	1.4	-0.8	21	0	33	0	7.4	0.8
EWW	52	0	4	1.6	0.6	55	0	15	0	14.3	2.7
FDX	414	1	33	1.4	0.1	412	0	34	0	7.2	-0.2
FIN	30	0	10	1.7	0.6	30	0	13	0	12.9	1.4
GCO	130	1	12	1.5	0.2	131	0	16	0	9.4	0.3
GTI	60	0	7	2.0	-0.6	61	0	11	0	10.2	2.4
HAL	213	2	42	1.7	0.3	211	0	40	0	8.6	0.6
ICE	44	0	7	1.5	-0.8	42	0	5	0	9.9	1.5
JAA	45	2	9	2.4	-0.1	45	0	4	0	7.8	2.6
JAL	124	2	7	1.7	0.2	124	0	9	0	8.3	0.7
JAZ	133	1	4	1.5	0.6	136	0	4	0	7.4	0.3
KAL	57	0	30	2.1	-0.5	57	0	30	0	9.1	1.1
KIW	86	0	30	3.1	1.9	117	1	27	0	8.5	-0.4
KLM	80	1	3	1.3	-0.1	71	1	6	0	8.1	-0.1
LAN	23	0	0	0.9	0.3	25	0	0	0	5.5	1.7
LIB	93	3	10	2.3	1.1	55	4	9	0	5.8	1.3
MAS	54	0	28	1.5	-0.4	54	2	30	0	9.1	1.6
MPH	79	0	3	1.7	-0.5	70	1	4	0	10.1	-1.2
NCA	92	0	0	1.7	0.0	64	2	2	0	6.0	0.7
NWA	349	1	18	1.7	0.4	356	0	18	0	8.6	0.4
NZL	16773	0	54	1.4	0.3	16773	0	54	0	5.3	0.0
PAC	112	4	16	1.6	0.2	115	0	11	0	7.6	1.4
QFA	118	0	55	1.0	0.1	119	0	54	0	5.6	-0.1
RCH	56	0	100	3.6	-1.9	49	0	88	0	15.5	-0.6
RRR	164	9	23	2.8	1.0	153	0	20	0	13.9	1.6
SAA	36	0	0	1.3	-0.8	36	0	6	0	12.7	-3.3
SFR	28	0	7	3.1	-0.2	28	0	0	0	6.1	0.8
SIA	31	0	0	0.7	0.1	31	0	0	0	4.0	0.7
SKI	26	19	54	5.5	-2.6	46	0	24	0	14.1	0.3
UAL	501480	0	98	1.2	-0.1	500678	0	98	0	4.4	0.3
UPS	223	0	38	1.9	0.6	214	0	40	0	10.6	0.1
WOA	27	7	7	1.0	0.1	32	0	9	0	9.6	2.0
AR	1172	0	100	2.1	1.6	1160	0	49	0	5.3	0.2
AU	29943	0	53	1.4	0.4	30237	0	53	0	4.4	-0.1
EU	464639	0	66	1.0	0.2	462074	0	66	0	4.1	0.0
KL	1236	0	57	1.1	0.7	1232	0	57	0	3.9	0.2
LH	1210	0	65	1.4	0.6	1210	0	65	0	4.1	0.5
MK	2289	0	58	1.5	1.1	2281	0	54	0	4.3	0.6
SA	3633	0	72	1.8	0.7	3631	0	56	0	5.0	0.0
N	39	13	31	2.4	0.0	40	0	18	0	9.0	1.2
US ACARS	1852043	0	77	1.2	0.3	1847451	0	77	0	4.4	0.3

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. NOVEMBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 49526

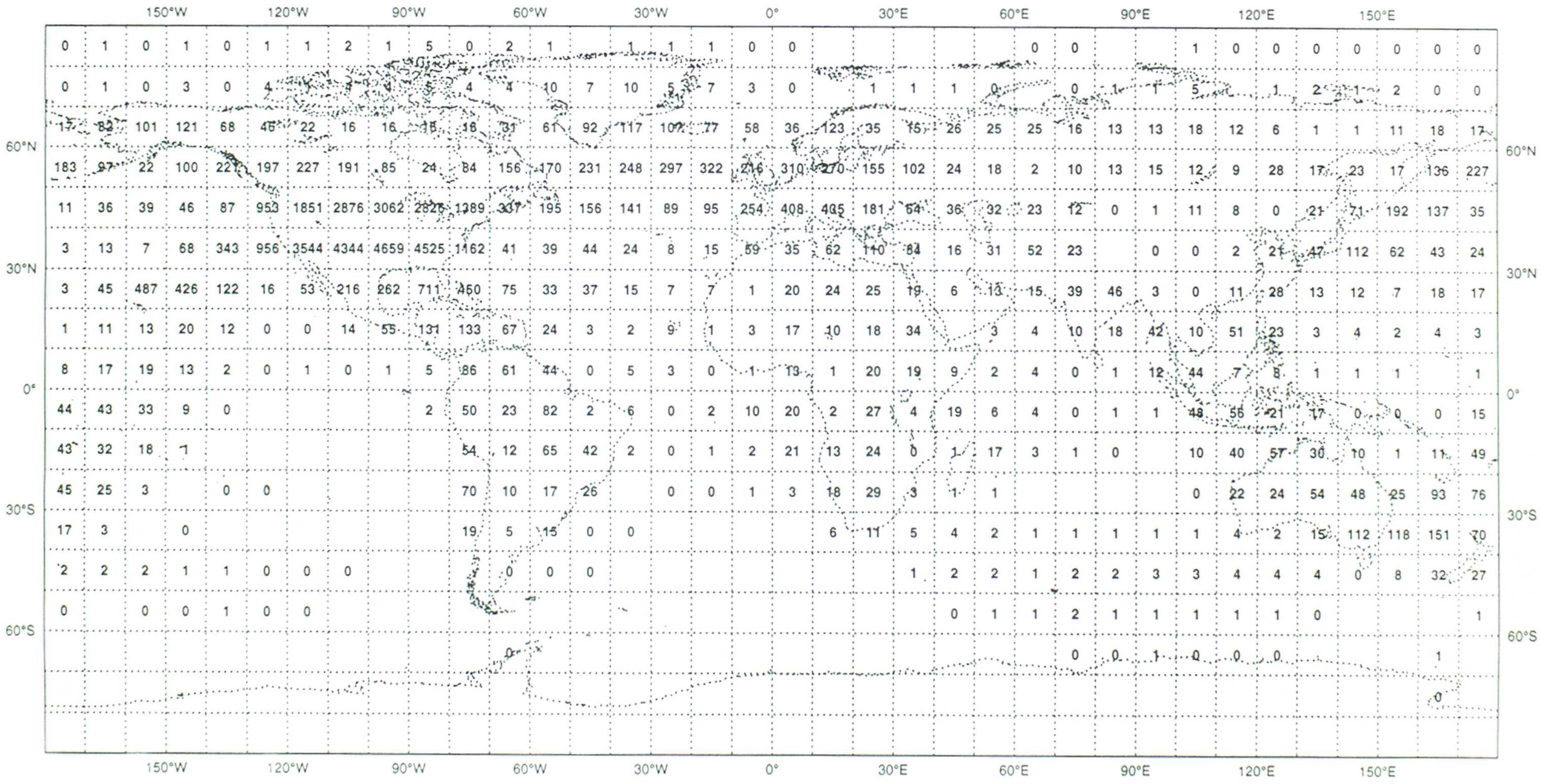

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 1 0 1 0 1 1 2 1 5 0 2 1 1 1 1 0 0 0 0 1 0 0 0 0 0 0 0
0 1 0 3 0 4 1 4 4 5 4 4 10 7 10 5 7 3 0 1 1 1 0 0 1 1 5 1 2 1 2 0 0
17 82 101 121 68 46 22 16 16 15 18 31 61 92 117 107 77 58 36 123 35 15 26 25 25 16 13 13 18 12 6 1 1 11 18 17
183 97 22 100 221 197 227 191 85 24 84 156 170 231 248 297 322 216 310 270 155 102 24 18 2 10 13 15 12 9 28 17 23 17 136 227
11 36 39 46 87 953 1851 2876 3062 2826 1389 337 195 156 141 89 95 254 408 405 181 64 36 32 23 12 0 1 11 8 0 21 71 192 137 35
3 13 7 68 343 956 3544 4344 4659 4525 1162 41 39 44 24 8 15 59 35 62 110 84 16 31 52 23 0 0 2 21 47 112 62 43 24
3 45 487 426 122 16 53 216 262 711 460 75 33 37 15 7 7 1 20 24 25 19 6 13 15 39 46 3 0 11 28 13 12 7 18 17
1 11 13 20 12 0 0 14 55 131 133 67 24 3 2 9 1 3 17 10 18 34 3 4 10 18 42 10 51 23 3 4 2 4 3
8 17 19 13 2 0 1 0 1 5 86 61 44 0 5 3 0 1 13 1 20 19 9 2 4 0 1 12 44 7 8 1 1 1 1
44 43 33 9 0 2 50 23 82 2 6 0 2 10 20 2 27 4 19 6 4 0 1 1 48 56 21 17 0 0 0 15
43 32 18 1 54 12 65 42 2 0 1 2 21 13 24 0 1 17 3 1 0 10 40 57 30 10 1 11 49
45 25 3 0 0 70 10 17 26 0 0 1 3 18 29 3 1 1 0 22 24 54 48 25 93 76
17 3 0 19 5 15 0 0 6 11 5 4 2 1 1 1 1 1 4 2 15 112 118 151 70
2 2 2 1 1 0 0 0 0 0 0 1 2 2 1 2 2 3 3 4 4 4 0 8 32 27
0 0 0 1 0 0 0 1 1 2 1 1 1 1 1 0 1
0 0 0 1 0 0 0 1
0

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. NOVEMBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 95688

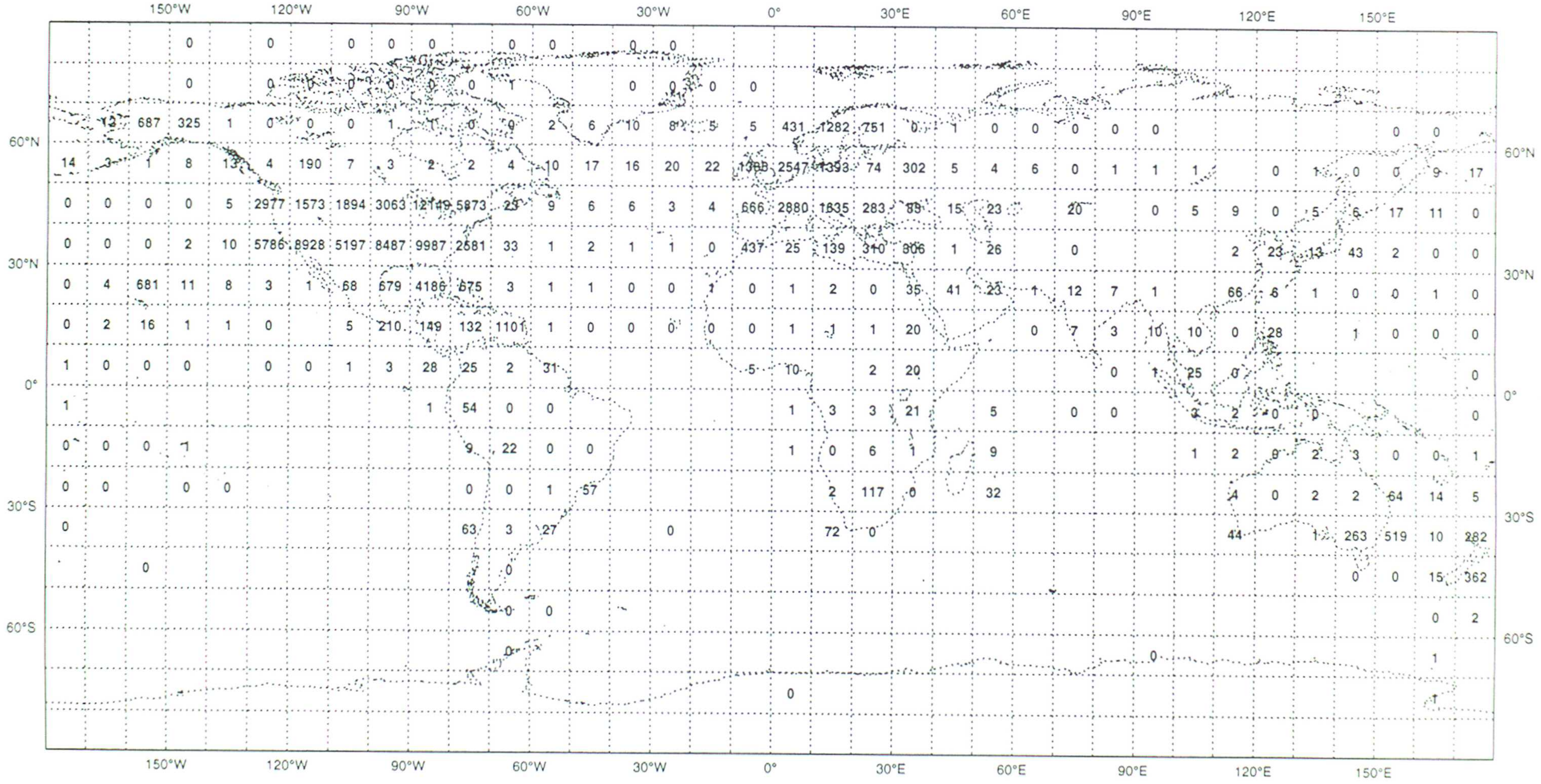

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 1 0 0 0 0
13 687 325 1 0 0 0 1 1 0 0 2 6 10 8 5 5 431 1282 751 0 1 0 0 0 0 0 0 0
14 3 1 8 13 4 190 7 3 2 2 4 10 17 16 20 22 1308 2547 1393 74 302 5 4 6 0 1 1 1 0 1 0 0 9 17
0 0 0 0 5 2977 1573 1894 3063 12149 5873 23 9 6 6 3 4 666 2880 1635 283 89 15 23 20 0 5 9 0 5 6 17 11 0
0 0 0 2 10 5786 8928 5197 8487 9987 2681 33 1 2 1 1 0 437 25 139 310 806 1 26 0 2 23 13 43 2 0 0
0 4 681 11 8 3 1 68 679 4186 675 3 1 1 0 0 1 0 1 2 0 35 41 23 1 12 7 1 66 6 1 0 0 1 0
0 2 16 1 1 0 5 210 149 132 1101 1 0 0 0 0 0 1 1 1 20 0 7 3 10 10 0 28 1 0 0 0
1 0 0 0 0 0 1 3 28 25 2 31 5 10 2 20 0 1 25 0 0
1 1 54 0 0 1 3 3 21 5 0 0 3 2 0 0 0
0 0 0 1 9 22 0 0 1 0 6 1 9 1 2 9 2 3 0 0 1
0 0 0 0 0 0 1 57 2 117 0 32 4 0 2 2 64 14 5
0 63 3 27 0 72 0 44 1 263 519 10 282
0 0 0 0 15 362
0 0 0 2
0 0 1
0 1

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. NOVEMBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

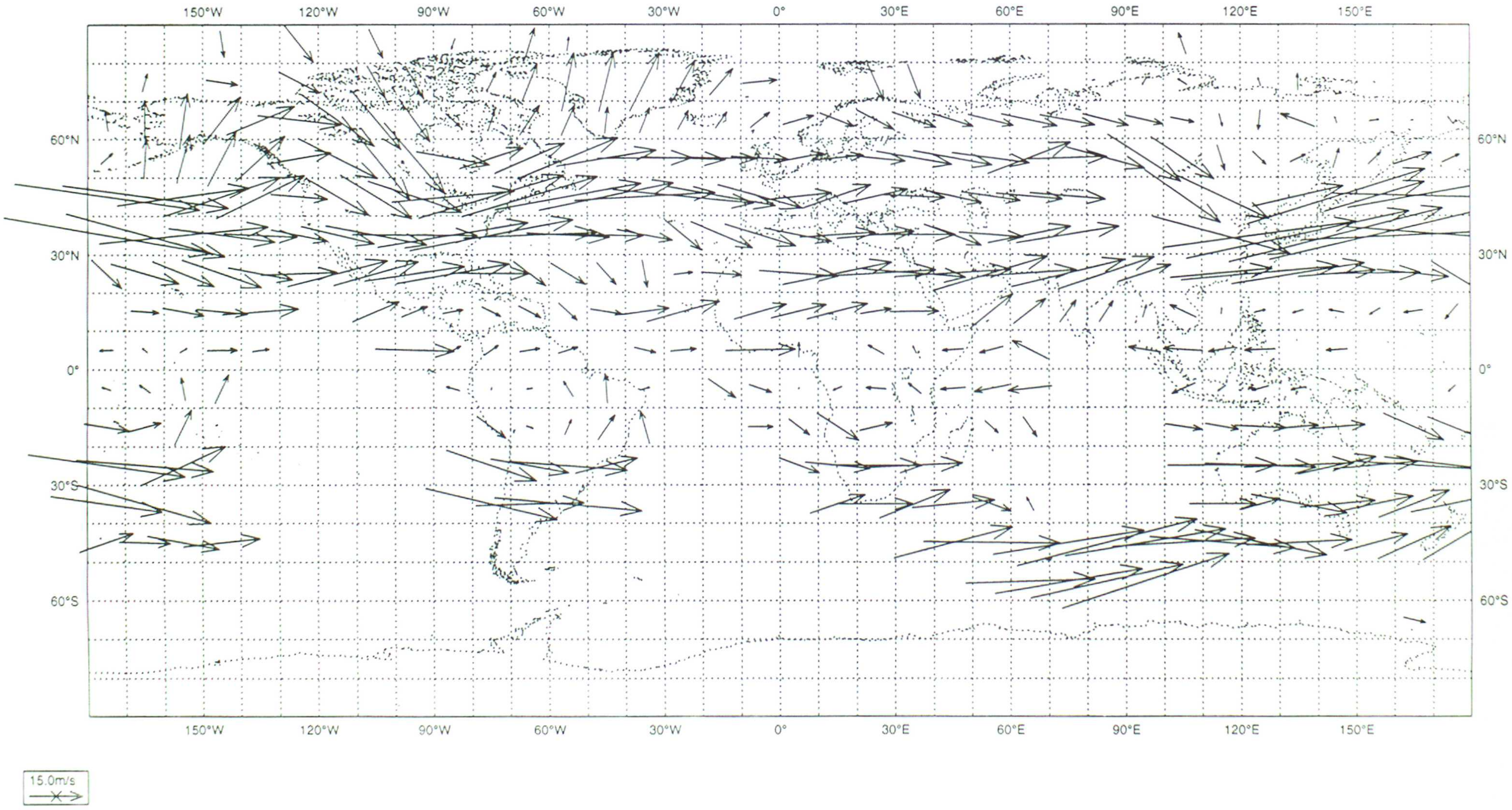

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. NOVEMBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

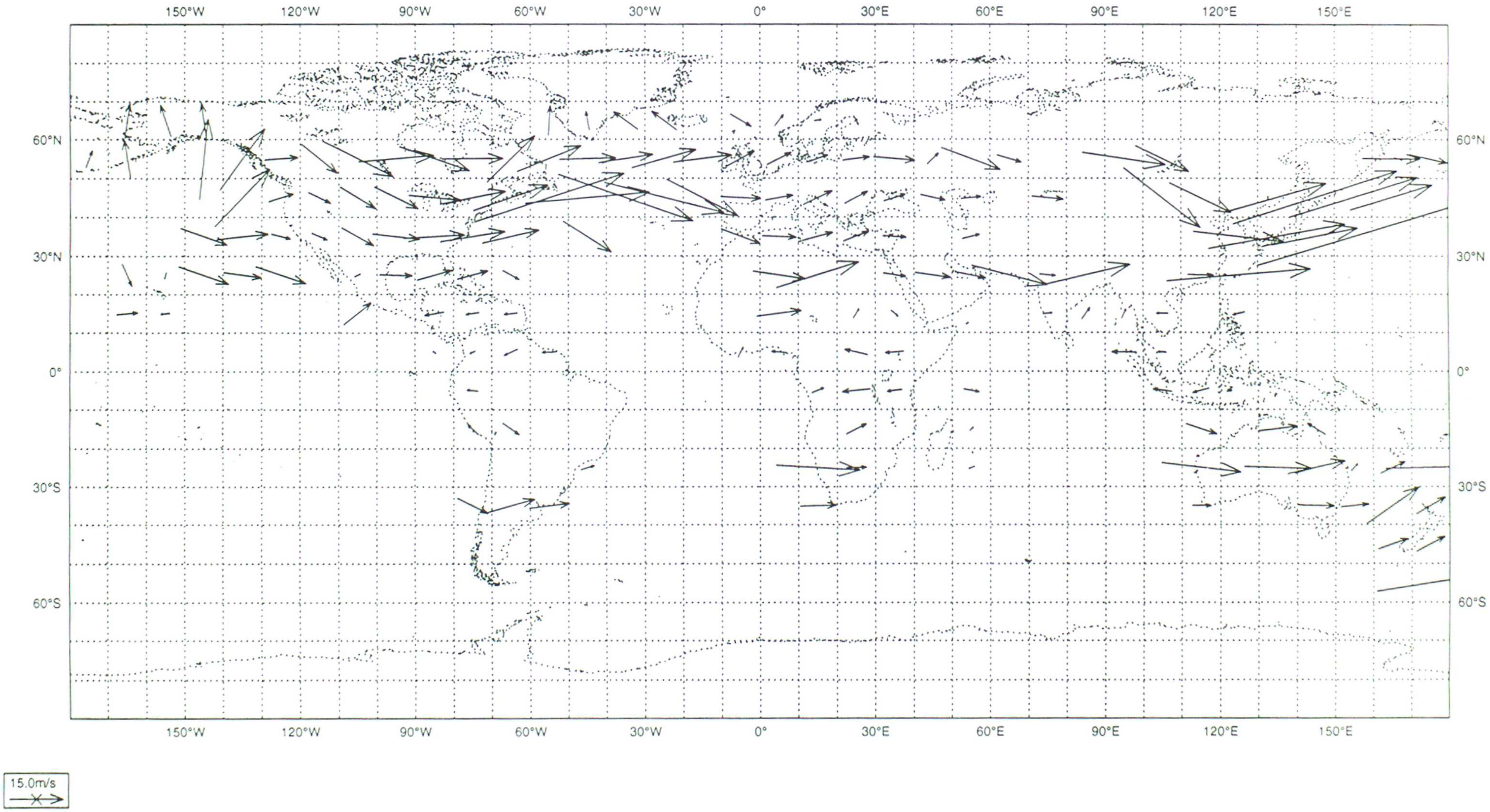

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. NOVEMBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

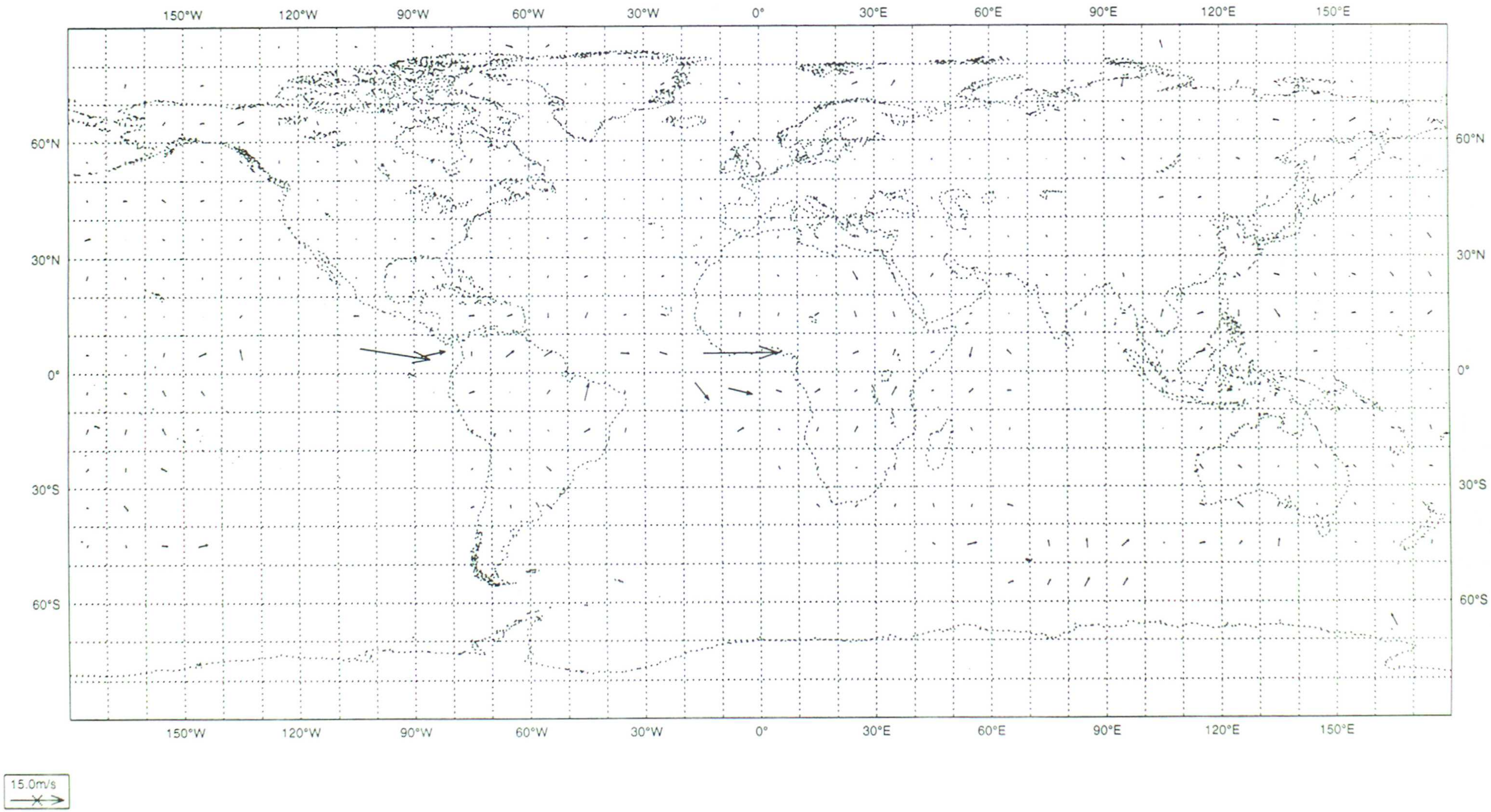

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. NOVEMBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

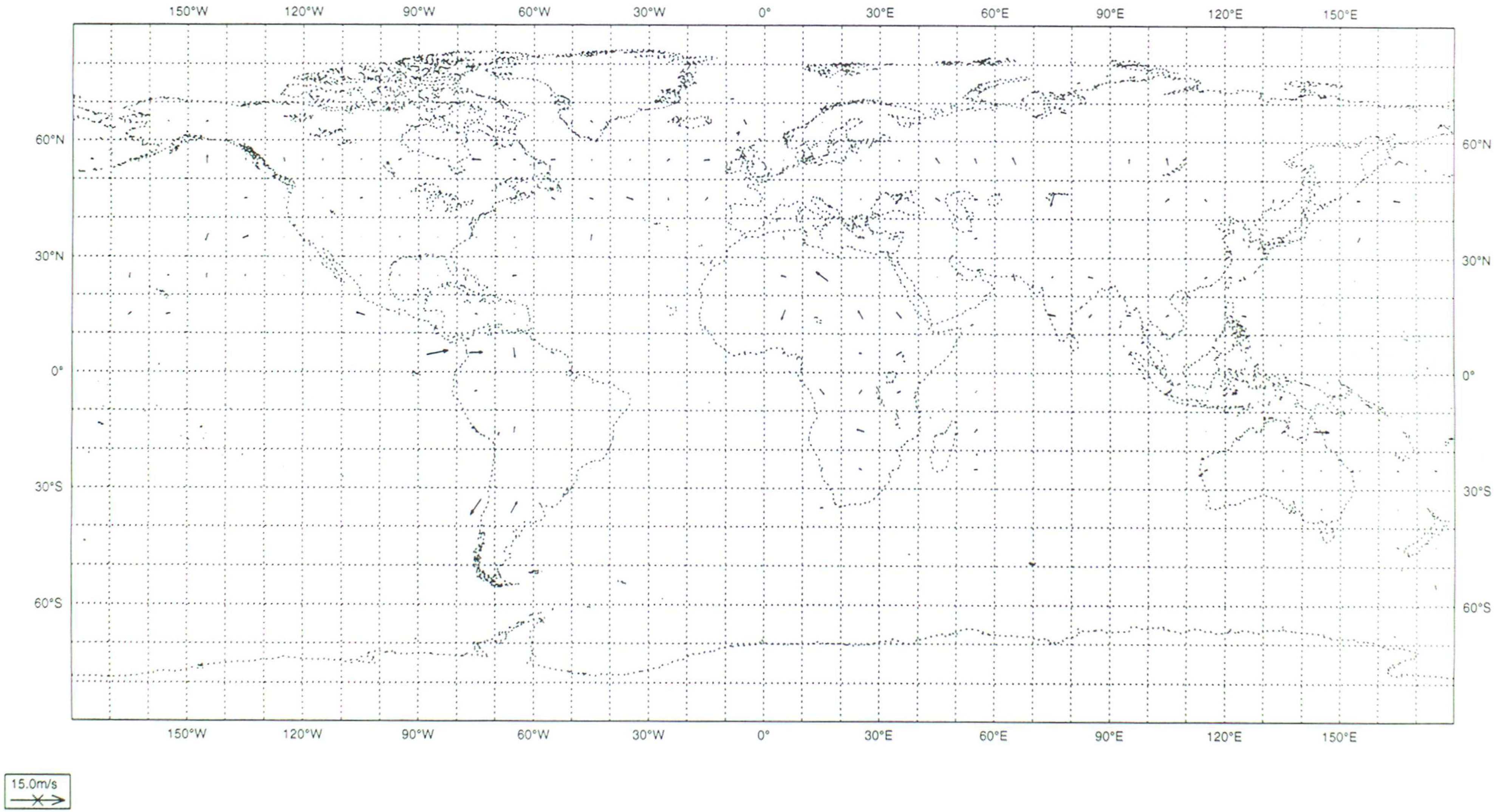

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). NOVEMBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

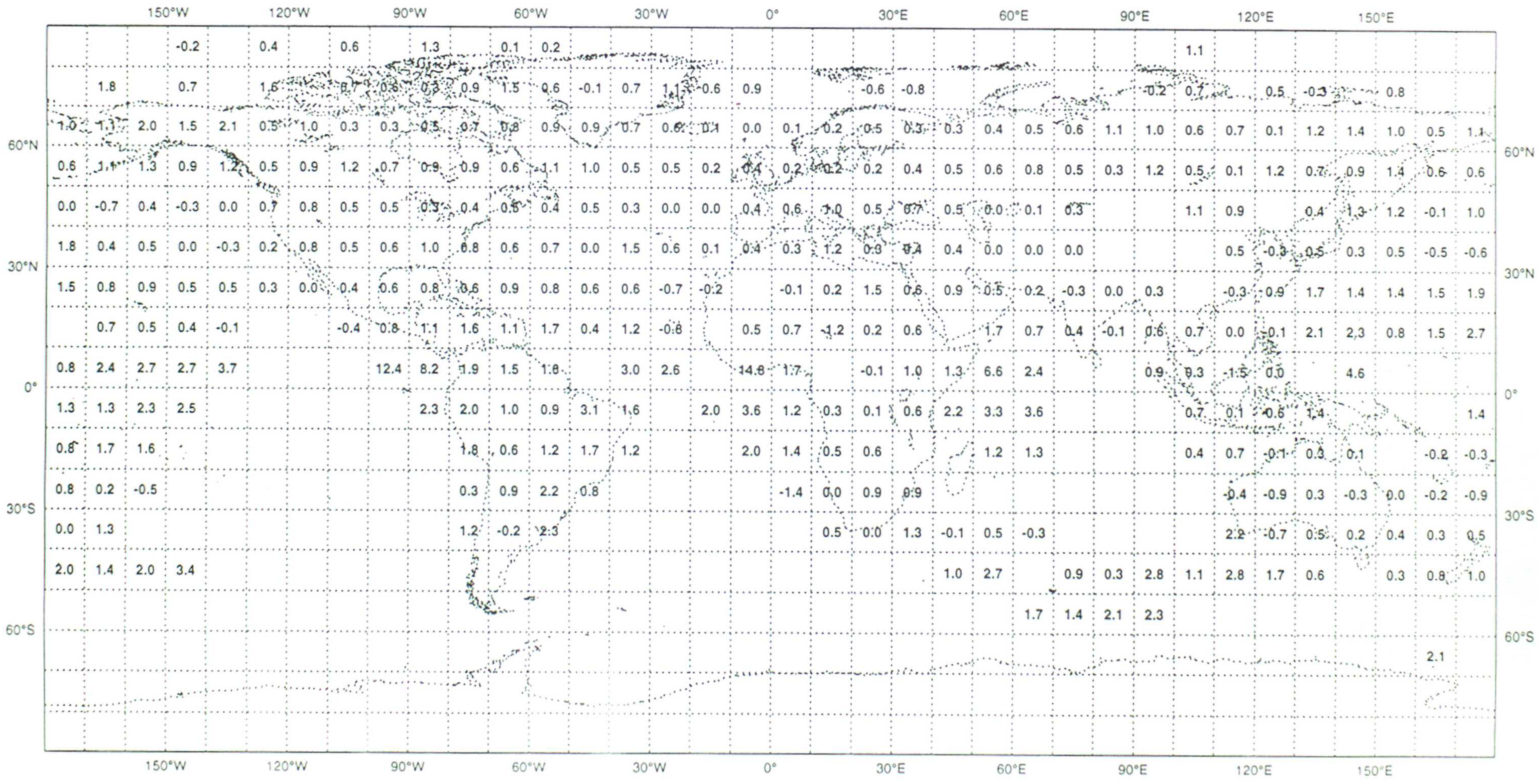

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-0.2 0.4 0.6 1.3 0.1 0.2 1.1
1.8 0.7 1.6 0.7 0.8 0.3 0.9 1.5 0.6 -0.1 0.7 1.1 -0.6 0.9 -0.6 -0.8 -0.2 0.7 0.5 -0.3 0.8
1.0 1.1 2.0 1.5 2.1 0.5 1.0 0.3 0.3 0.5 0.7 0.8 0.9 0.9 0.7 0.6 0.1 0.0 0.1 0.2 0.5 0.3 0.3 0.4 0.5 0.6 1.1 1.0 0.6 0.7 0.1 1.2 1.4 1.0 0.5 1.1
0.6 1.1 1.3 0.9 1.2 0.5 0.9 1.2 0.7 0.9 0.9 0.6 1.1 1.0 0.5 0.5 0.2 0.4 0.2 0.2 0.2 0.4 0.5 0.6 0.8 0.5 0.3 1.2 0.5 0.1 1.2 0.7 0.9 1.4 0.6 0.6
0.0 -0.7 0.4 -0.3 0.0 0.7 0.8 0.5 0.5 0.3 0.4 0.5 0.4 0.5 0.3 0.0 0.0 0.4 0.6 1.0 0.5 0.7 0.5 0.0 0.1 0.3 1.1 0.9 0.4 1.3 1.2 -0.1 1.0
1.8 0.4 0.5 0.0 -0.3 0.2 0.8 0.5 0.6 1.0 0.8 0.6 0.7 0.0 1.5 0.6 0.1 0.4 0.3 1.2 0.9 0.4 0.4 0.0 0.0 0.0 0.5 -0.3 0.5 0.3 0.5 -0.5 -0.6
1.5 0.8 0.9 0.5 0.5 0.3 0.0 0.4 0.6 0.8 0.6 0.9 0.8 0.6 0.6 -0.7 -0.2 -0.1 0.2 1.5 0.6 0.9 0.5 0.2 -0.3 0.0 0.3 -0.3 -0.9 1.7 1.4 1.4 1.5 1.9
0.7 0.5 0.4 -0.1 -0.4 0.8 1.1 1.6 1.1 1.7 0.4 1.2 -0.8 0.5 0.7 -1.2 0.2 0.6 1.7 0.7 0.4 -0.1 0.6 0.7 0.0 -0.1 2.1 2.3 0.8 1.5 2.7
0.8 2.4 2.7 2.7 3.7 12.4 8.2 1.9 1.5 1.8 3.0 2.6 14.8 1.7 -0.1 1.0 1.3 6.6 2.4 0.9 0.3 -1.5 0.0 4.6
1.3 1.3 2.3 2.5 2.3 2.0 1.0 0.9 3.1 1.6 2.0 3.6 1.2 0.3 0.1 0.6 2.2 3.3 3.6 0.7 0.1 -0.6 1.4 1.4
0.8 1.7 1.6 1.8 0.6 1.2 1.7 1.2 2.0 1.4 0.5 0.6 1.2 1.3 0.4 0.7 -0.1 0.3 0.1 -0.2 -0.3
0.8 0.2 -0.5 0.3 0.9 2.2 0.8 -1.4 0.0 0.9 0.9 -0.4 -0.9 0.3 -0.3 0.0 -0.2 -0.9
0.0 1.3 1.2 -0.2 2.3 0.5 0.0 1.3 -0.1 0.5 -0.3 2.2 -0.7 0.5 0.2 0.4 0.3 0.5
2.0 1.4 2.0 3.4 1.0 2.7 0.9 0.3 2.8 1.1 2.8 1.7 0.6 0.3 0.8 1.0
1.7 1.4 2.1 2.3
2.1

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). NOVEMBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

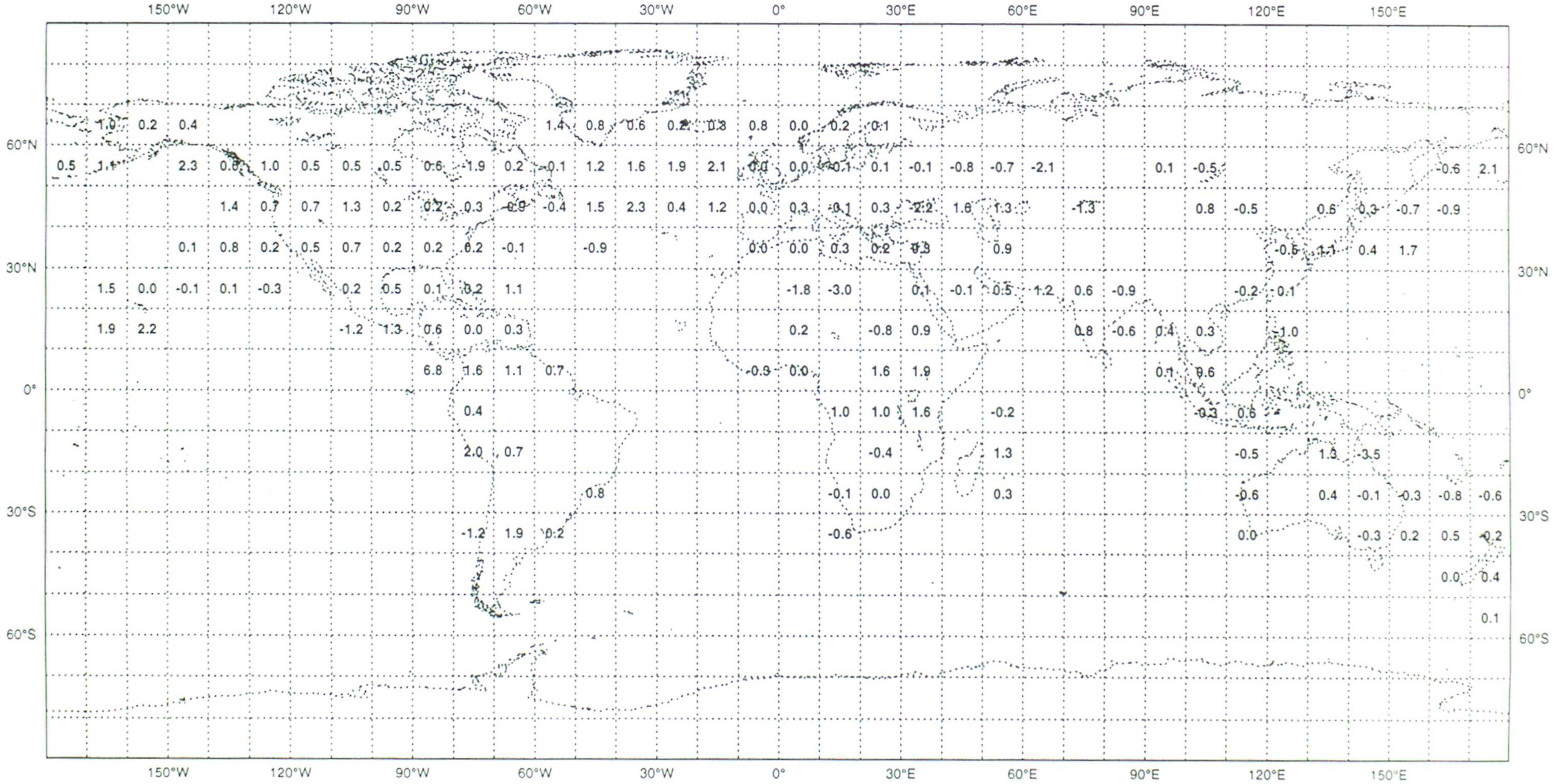

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
1.0 0.2 0.4 1.4 0.8 0.6 0.2 0.8 0.8 0.0 0.2 0.1
0.5 1.1 2.3 0.6 1.0 0.5 0.5 0.5 0.6 -1.9 0.2 -0.1 1.2 1.6 1.9 2.1 0.0 0.0 -0.1 0.1 -0.1 -0.8 -0.7 -2.1 0.1 -0.5 -0.6 2.1
1.4 0.7 0.7 1.3 0.2 0.2 0.3 -0.9 -0.4 1.5 2.3 0.4 1.2 0.0 0.3 -0.1 0.3 -2.2 1.6 1.3 -1.3 0.8 -0.5 0.6 0.3 -0.7 -0.9
0.1 0.8 0.2 0.5 0.7 0.2 0.2 0.2 -0.1 -0.9 0.0 0.0 0.3 0.2 0.3 0.9 -0.5 1.1 0.4 1.7
1.5 0.0 -0.1 0.1 -0.3 0.2 0.5 0.1 0.2 1.1 -1.8 -3.0 0.1 -0.1 0.5 1.2 0.6 -0.9 -0.2 0.1
1.9 2.2 -1.2 1.3 0.6 0.0 0.3 0.2 -0.8 0.9 0.8 -0.6 0.4 0.3 -1.0
6.8 1.6 1.1 0.7 -0.9 0.0 1.6 1.9 0.1 0.6
0.4 1.0 1.0 1.6 -0.2 -0.3 0.6
2.0 0.7 -0.4 1.3 -0.5 1.3 -3.5
0.8 -0.1 0.0 0.3 -0.6 0.4 -0.1 -0.3 -0.8 -0.6
-1.2 1.9 0.2 -0.6 0.0 -0.3 0.2 0.5 -0.2
0.0 0.4
0.1

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). NOVEMBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

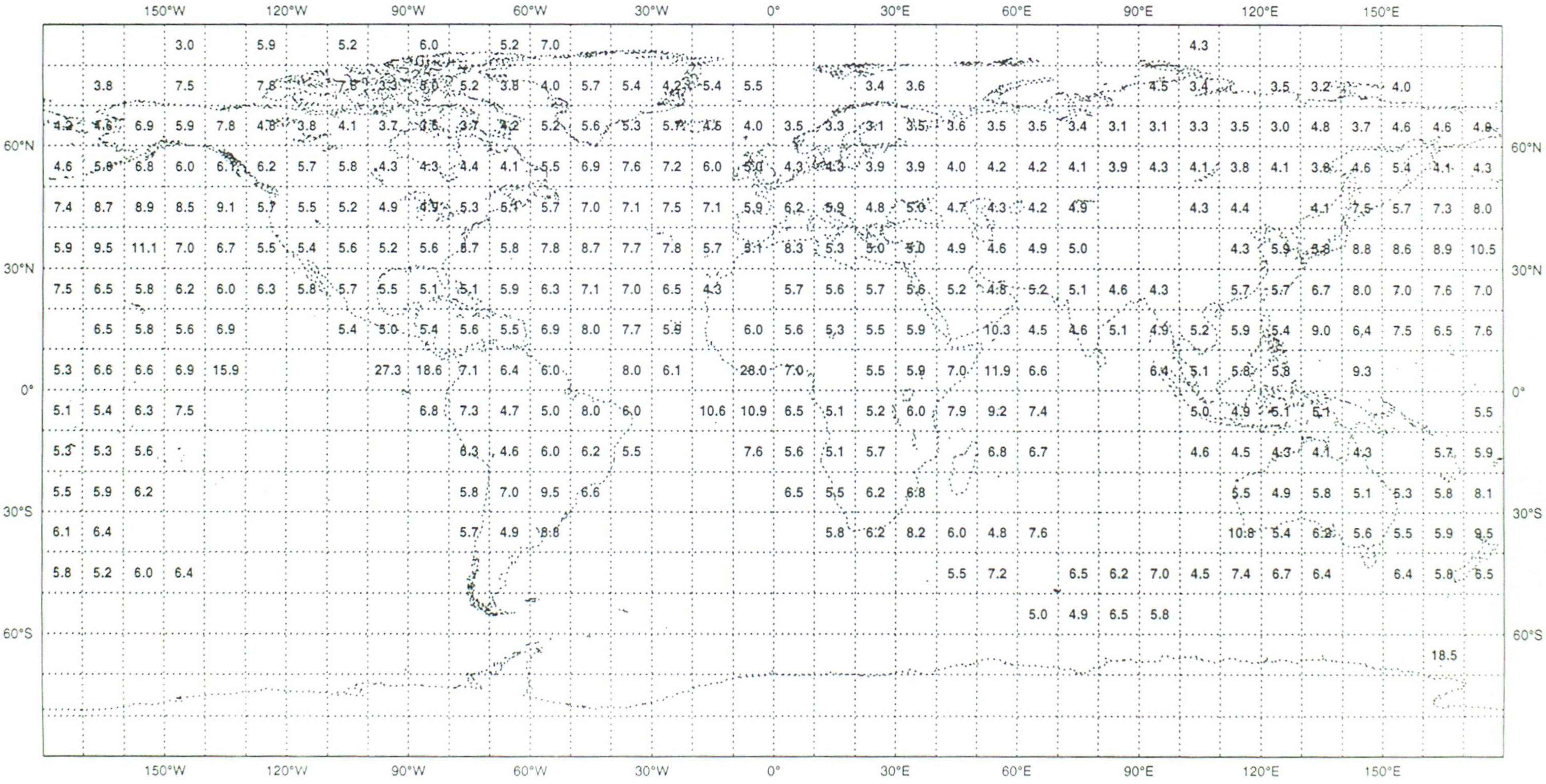

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
3.0 5.9 5.2 6.0 5.2 7.0 4.3
3.8 7.5 7.8 7.8 3.3 6.0 5.2 3.8 4.0 5.7 5.4 4.2 5.4 5.5 3.4 3.6 4.5 3.4 3.5 3.2 4.0
4.2 4.6 6.9 5.9 7.8 4.8 3.8 4.1 3.7 3.5 3.7 4.2 5.2 5.6 5.3 5.7 4.5 4.0 3.5 3.3 3.1 3.5 3.6 3.5 3.5 3.4 3.1 3.1 3.3 3.5 3.0 4.8 3.7 4.6 4.6 4.8
4.6 5.8 6.8 6.0 6.1 6.2 5.7 5.8 4.3 4.3 4.4 4.1 5.5 6.9 7.6 7.2 6.0 5.0 4.3 4.3 3.9 3.9 4.0 4.2 4.2 4.1 3.9 4.3 4.1 3.8 4.1 3.8 4.6 5.4 4.1 4.3
7.4 8.7 8.9 8.5 9.1 5.7 5.5 5.2 4.9 4.9 5.3 5.1 5.7 7.0 7.1 7.5 7.1 5.9 6.2 5.9 4.8 5.0 4.7 4.3 4.2 4.9 4.3 4.4 4.1 7.5 5.7 7.3 8.0
5.9 9.5 11.1 7.0 6.7 5.5 5.4 5.6 5.2 5.6 8.7 5.8 7.8 8.7 7.7 7.8 5.7 3.1 8.3 5.3 5.0 5.0 4.9 4.6 4.9 5.0 4.3 5.9 5.8 8.8 8.6 8.9 10.5
7.5 6.5 5.8 6.2 6.0 6.3 5.8 5.7 5.5 5.1 5.1 5.9 6.3 7.1 7.0 6.5 4.3 5.7 5.6 5.7 5.6 5.2 4.8 5.2 5.1 4.6 4.3 5.7 5.7 6.7 8.0 7.0 7.6 7.0
6.5 5.8 5.6 6.9 5.4 5.0 5.4 5.6 5.5 6.9 8.0 7.7 5.9 6.0 5.6 5.3 5.5 5.9 10.3 4.5 4.6 5.1 4.9 5.2 5.9 5.4 9.0 6.4 7.5 6.5 7.6
5.3 6.6 6.6 6.9 15.9 27.3 18.6 7.1 6.4 6.0 8.0 6.1 28.0 7.0 5.5 5.9 7.0 11.9 6.6 6.4 5.1 5.8 5.8 9.3
5.1 5.4 6.3 7.5 6.8 7.3 4.7 5.0 8.0 6.0 10.6 10.9 6.5 5.1 5.2 6.0 7.9 9.2 7.4 5.0 4.9 6.1 5.1 5.5
5.3 5.3 5.6 6.3 4.6 6.0 6.2 5.5 7.6 5.6 5.1 5.7 6.8 6.7 4.6 4.5 4.3 4.1 4.3 5.7 5.9
5.5 5.9 6.2 5.8 7.0 9.5 6.6 6.5 5.5 6.2 6.8 5.5 4.9 5.8 5.1 5.3 5.8 8.1
6.1 6.4 5.7 4.9 8.8 5.8 6.2 8.2 6.0 4.8 7.6 10.8 5.4 6.2 5.6 5.5 5.9 9.5
5.8 5.2 6.0 6.4 5.5 7.2 6.5 6.2 7.0 4.5 7.4 6.7 6.4 6.4 5.8 6.5
5.0 4.9 6.5 5.8
18.5

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). NOVEMBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

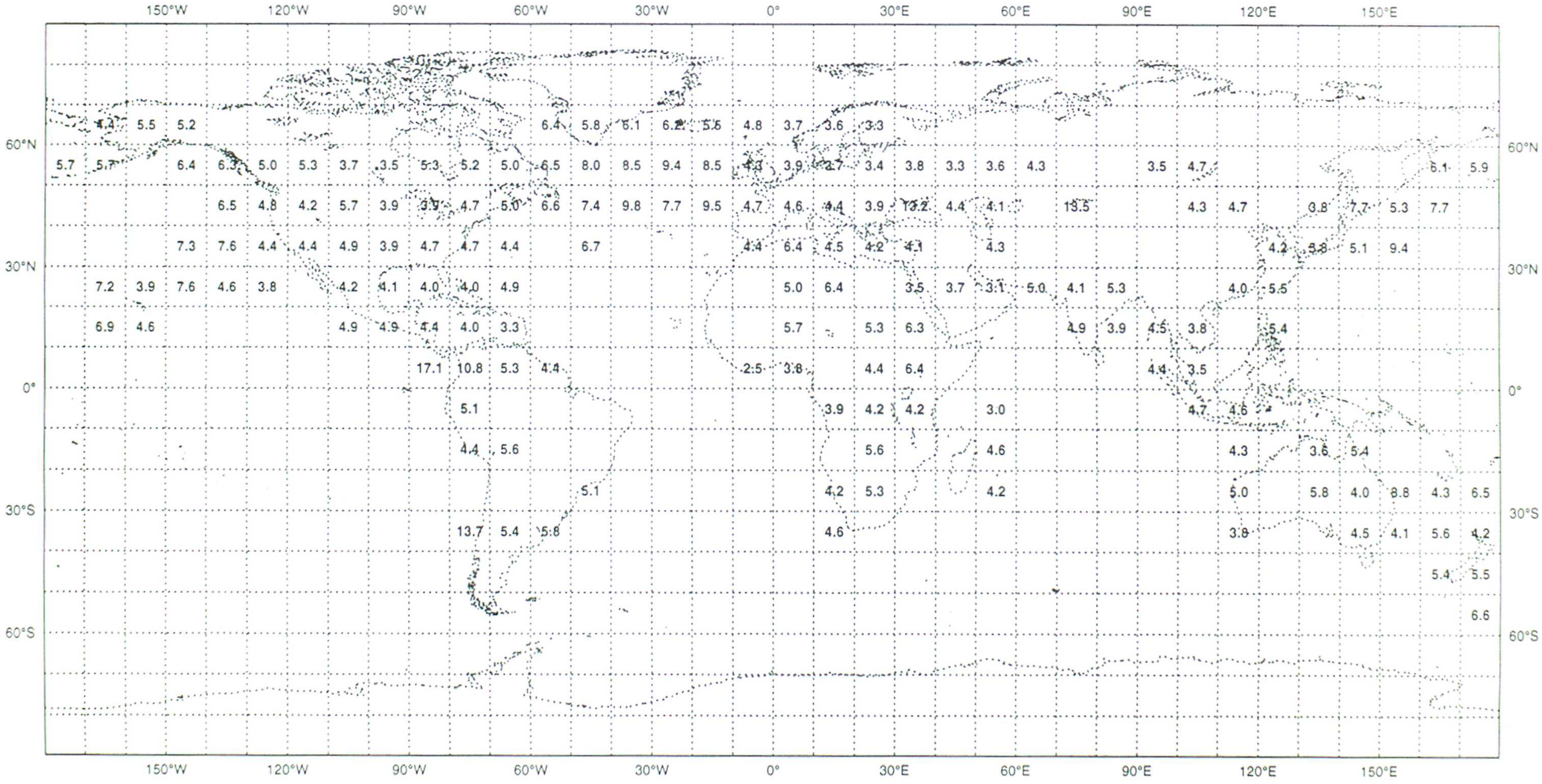

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4.4 5.5 5.2 6.4 5.8 6.1 6.2 5.6 4.8 3.7 3.6 3.3
5.7 5.7 6.4 6.3 5.0 5.3 3.7 3.5 5.3 5.2 5.0 6.5 8.0 8.5 9.4 8.5 4.3 3.9 2.7 3.4 3.8 3.3 3.6 4.3 3.5 4.7 6.1 5.9
6.5 4.8 4.2 5.7 3.9 3.9 4.7 5.0 6.6 7.4 9.8 7.7 9.5 4.7 4.6 4.4 3.9 13.2 4.4 4.1 13.5 4.3 4.7 3.8 7.7 5.3 7.7
7.3 7.6 4.4 4.4 4.9 3.9 4.7 4.7 4.4 6.7 4.4 6.4 4.5 4.2 4.1 4.3 4.2 3.8 5.1 9.4
7.2 3.9 7.6 4.6 3.8 4.2 4.1 4.0 4.0 4.9 5.0 6.4 3.5 3.7 3.1 5.0 4.1 5.3 4.0 5.5
6.9 4.6 4.9 4.9 4.4 4.0 3.3 5.7 5.3 6.3 4.9 3.9 4.5 3.8 5.4
17.1 10.8 5.3 4.4 2.5 3.8 4.4 6.4 4.4 3.5
5.1 3.9 4.2 4.2 3.0 4.7 4.6
4.4 5.6 5.6 4.6 4.3 3.6 5.4
5.1 4.2 5.3 4.2 5.0 5.8 4.0 8.8 4.3 6.5
13.7 5.4 5.8 4.6 3.8 4.5 4.1 5.6 4.2
5.4 5.5
6.6

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: November 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
26477	12	Z	1000	56/ 31	17	9	32.6	-31.1	45.1	8
32098	00	Z	1000	49/ 143	17	11	39.2	-33.6	51.7	6
42027	12	Z	200	34/ 75	13	0	78.1	39.8	87.7	4
42101	12	Z	150	30/ 76	16	0	111.3	-43.9	119.7	6
42182	00	Z	1000	29/ 77	10	16	5.7	-90.6	90.8	5
42182	12	Z	1000	29/ 77	4	25	2.4	-96.8	96.8	4
42339	12	Z	200	26/ 73	21	0	108.2	-30.4	112.4	5
42361	00	Z	1000	26/ 78	17	6	7.1	-85.0	85.3	5
42361	12	Z	1000	26/ 78	6	18	2.2	-93.8	93.9	5
42369	00	Z	200	27/ 81	14	0	72.4	-52.3	89.3	6
42369	12	Z	1000	27/ 81	26	1	14.6	-35.8	38.7	6
42379	00	Z	100	27/ 83	19	0	110.5	16.4	111.7	4
42379	12	Z	150	27/ 83	17	0	105.5	48.6	116.2	5
42410	00	Z	1000	26/ 92	12	15	6.8	-92.1	92.3	4
42647	12	Z	200	23/ 73	14	1	75.9	38.4	85.0	4
42701	12	Z	150	23/ 85	15	0	89.7	-71.7	114.9	5
42724	00	Z	250	24/ 91	19	0	60.3	-62.8	87.1	5
42724	12	Z	150	24/ 91	13	2	62.1	-130.5	144.6	4
42867	00	Z	150	21/ 79	21	1	113.4	-55.7	126.3	6
42874	00	Z	200	21/ 82	12	0	85.0	-58.9	103.5	4
42971	00	Z	70	20/ 86	18	0	139.1	125.3	187.2	6
42971	12	Z	70	20/ 86	13	1	122.2	79.0	145.5	4
43003	00	Z	1000	19/ 73	29	0	11.0	-60.7	61.6	8
43003	12	Z	1000	19/ 73	29	0	12.3	-73.4	74.5	6
43014	00	Z	200	20/ 75	17	4	101.6	-102.2	144.1	7
43014	12	Z	150	20/ 75	10	2	174.1	-62.8	185.1	7
43150	00	Z	1000	18/ 83	23	4	9.0	-75.0	75.5	9
43192	00	Z	1000	15/ 74	3	21	2.9	-95.3	95.4	6
43295	00	Z	200	13/ 78	27	0	51.4	-67.4	84.7	4
43311	00	Z	200	11/ 73	25	0	83.4	-92.6	124.6	7
43311	12	Z	100	11/ 73	13	0	126.6	1.6	126.6	5
43353	00	Z	1000	10/ 76	24	2	11.3	-84.3	85.1	4
43371	00	Z	100	8/ 77	21	1	97.1	-120.7	154.9	6
43371	12	Z	50	8/ 77	18	1	104.0	201.4	226.7	4
58968	00	Z	1000	25/ 122	29	0	22.0	-21.9	31.1	5
84628	12	Z	850	-12/ -77	23	0	8.4	-65.5	66.1	4
91366	00	Z	30	9/ 168	22	1	108.9	259.1	281.1	4
96163	00	Z	1000	-1/ 100	3	7	8.8	-86.0	86.5	11
97180	00	Z	300	-5/ 120	10	0	45.1	-66.6	80.5	7

Figure 8. TEMP 500 hPa geopotential mean daily count. NOVEMBER 2002
All hours
Global average number of observations in 24 hours = 1141

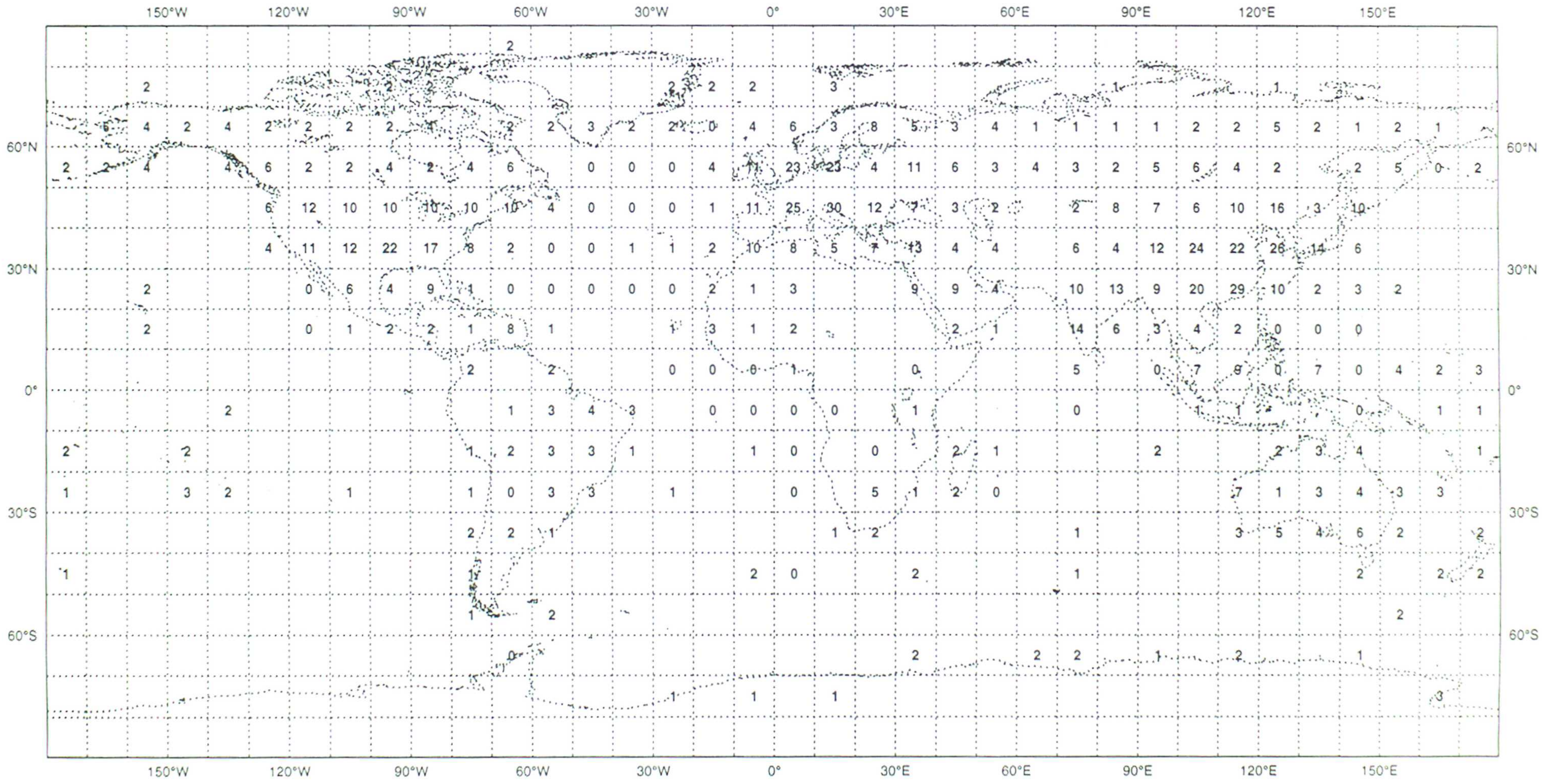

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: November 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
PSPIU	00	V	100	-5/ -81	28	1	100	-11.0	-4.5	27.2	3
PSPIU	12	V	150	-5/ -81	24	0	100	-9.1	0.4	27.7	3
07110	12	V	300	48/ -4	27	0	3	-2.7	0.1	17.0	1
10468	00	V	250	52/ 12	28	0	100	1.8	-3.6	17.2	1
40875	12	V	300	27/ 56	17	0	5	3.5	1.6	16.7	1
42410	12	V	300	26/ 92	14	0	100	-1.6	2.2	17.4	1
42809	00	V	150	23/ 88	22	0	4	-5.8	1.0	22.2	1
47138	00	V	150	36/ 129	29	0	3	-3.8	0.1	21.8	1
60360	12	V	200	37/ 8	11	0	100	4.8	-5.4	16.9	1
62378	00	V	200	30/ 31	28	0	100	-7.6	-3.1	15.6	2
62378	12	V	250	30/ 31	23	0	100	-4.7	-2.2	17.8	2
64500	12	V	150	0/ 9	18	0	100	10.8	1.5	15.2	1
68174	12	V	300	-24/ 29	12	0	100	-3.6	2.4	16.6	1
68512	12	V	200	-30/ 18	22	0	100	-8.3	-3.3	18.0	2
71701	12	V	300	46/ -66	23	0	17	-5.3	-0.4	16.5	2
80001	12	V	400	13/ -82	14	0	21	0.8	0.8	19.4	1
87576	12	V	150	-35/ -59	26	0	0	3.3	-6.8	15.2	1

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. NOVEMBER 2002
All hours
Global average number of observations in 24 hours = 1326

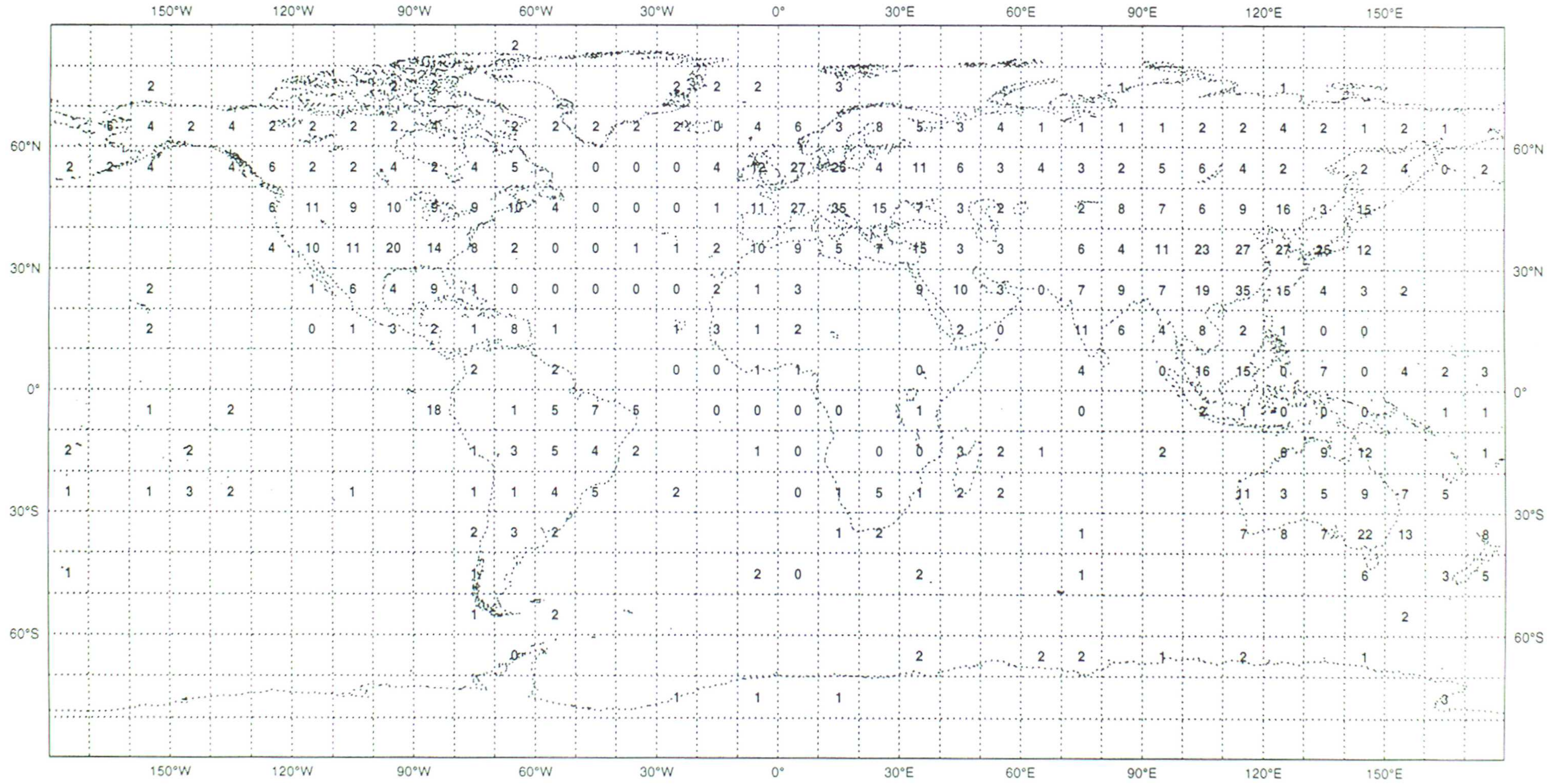

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: November 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.
SELECTION CRITERIA	:NUM OBS ≥ 5, and ABSOLUTE BIAS ≥ 10°, with SD < 30°, and MAX SPREAD < 10°	

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
08594	12	DD	17/ -23	21	-11.1	7.1	12.6
10468	12	DD	52/ 12	25	12.4	3.2	11.6
17280	12	DD	38/ 40	26	-11.4	4.6	10.8
29612	12	DD	55/ 78	27	20.5	2.9	7.1
42182	12	DD	29/ 77	20	10.2	7.4	12.1
42397	00	DD	27/ 88	8	12.3	9.2	9.2
62337	00	DD	31/ 34	27	-12.6	5.5	9.6
62337	12	DD	31/ 34	27	-14.2	2.7	7.4
91366	12	DD	9/ 168	20	13.1	9.9	27.3

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: November 2002

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa :Mean wind :Mean observation minus background vector wind differences :Mean observation minus background speed differences :RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. NOVEMBER 2002
Global average number of observations in 24 hours = 54930

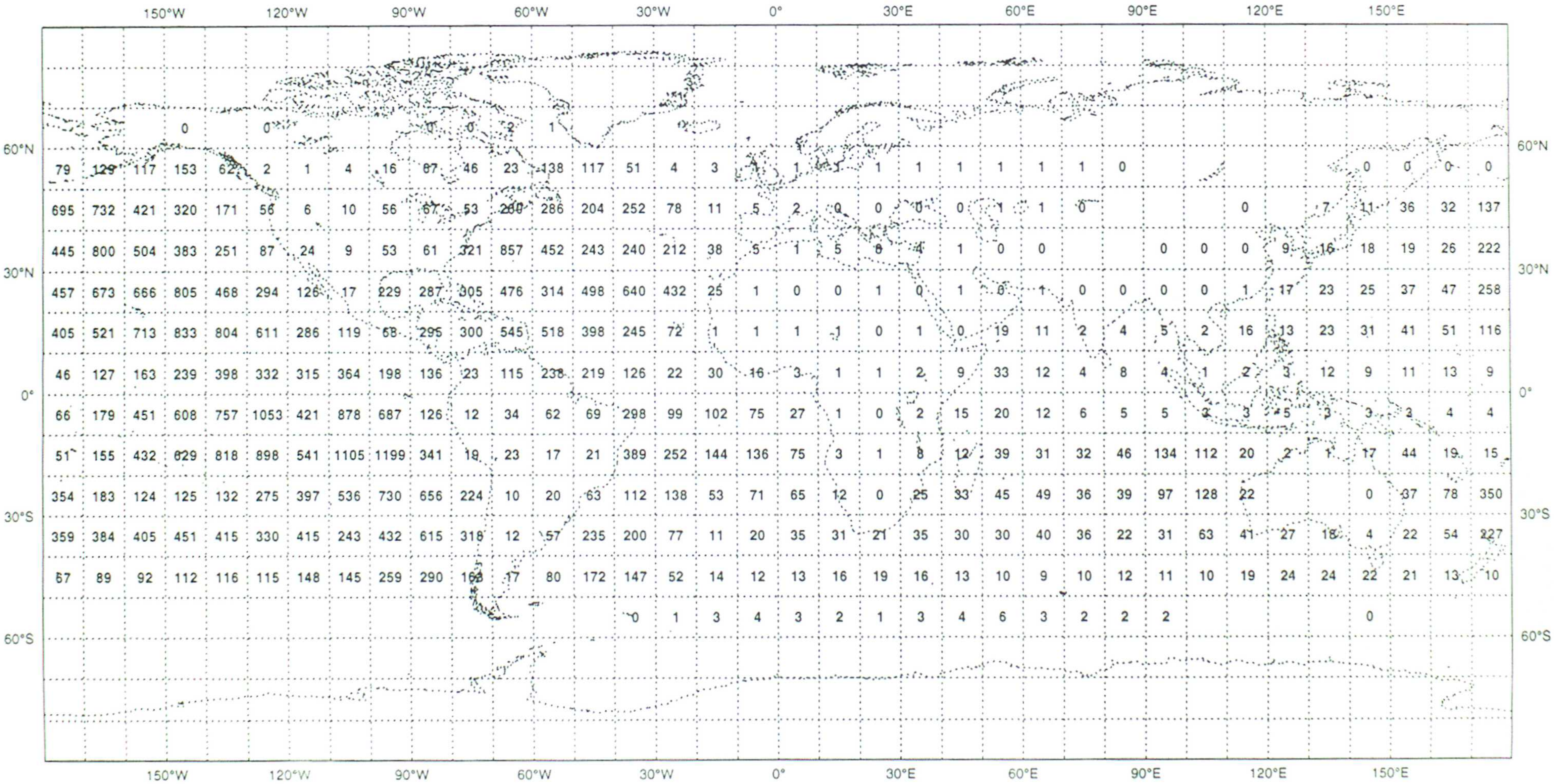

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0 0 0 0 2 1
79 129 117 153 62 2 1 4 16 67 46 23 138 117 51 4 3 1 1 1 1 1 1 1 1 1 0 0 0 0 0
695 732 421 320 171 56 6 10 56 67 53 200 286 204 252 78 11 5 2 0 0 0 0 1 1 0 0 7 11 36 32 137
445 800 504 383 251 87 24 9 53 61 321 857 452 243 240 212 38 5 1 5 6 4 1 0 0 0 0 0 9 16 18 19 26 222
457 673 666 805 468 294 126 17 229 287 305 476 314 498 640 432 25 1 0 0 1 0 1 0 1 0 0 0 0 1 17 23 25 37 47 258
405 521 713 833 804 611 286 119 68 295 300 545 518 398 245 72 1 1 1 1 0 1 0 19 11 2 4 5 2 16 13 23 31 41 51 116
46 127 163 239 398 332 315 364 198 136 23 115 238 219 126 22 30 16 3 1 1 2 9 33 12 4 8 4 1 2 3 12 9 11 13 9
66 179 451 608 757 1053 421 878 687 126 12 34 62 69 298 99 102 75 27 1 0 2 15 20 12 6 5 5 3 3 5 3 3 3 4 4
51 155 432 629 818 898 541 1105 1199 341 19 23 17 21 389 252 144 136 75 3 1 8 12 39 31 32 46 134 112 20 2 1 17 44 19 15
354 183 124 125 132 275 397 536 730 656 224 10 20 63 112 138 53 71 65 12 0 25 33 45 49 36 39 97 128 22 0 37 78 350
359 384 405 451 415 330 415 243 432 615 318 12 57 235 200 77 11 20 35 31 21 35 30 30 40 36 22 31 63 41 27 18 4 22 54 227
67 89 92 112 116 115 148 145 259 290 163 17 80 172 147 52 14 12 13 16 19 16 13 10 9 10 12 11 10 19 24 24 22 21 13 10
0 1 3 4 3 2 1 3 4 6 3 2 2 2 0

Figure 11. SATOB 701 - 1000 hPa vector mean wind. NOVEMBER 2002
All observations
Arrows are plotted where greater than 10 obs are present

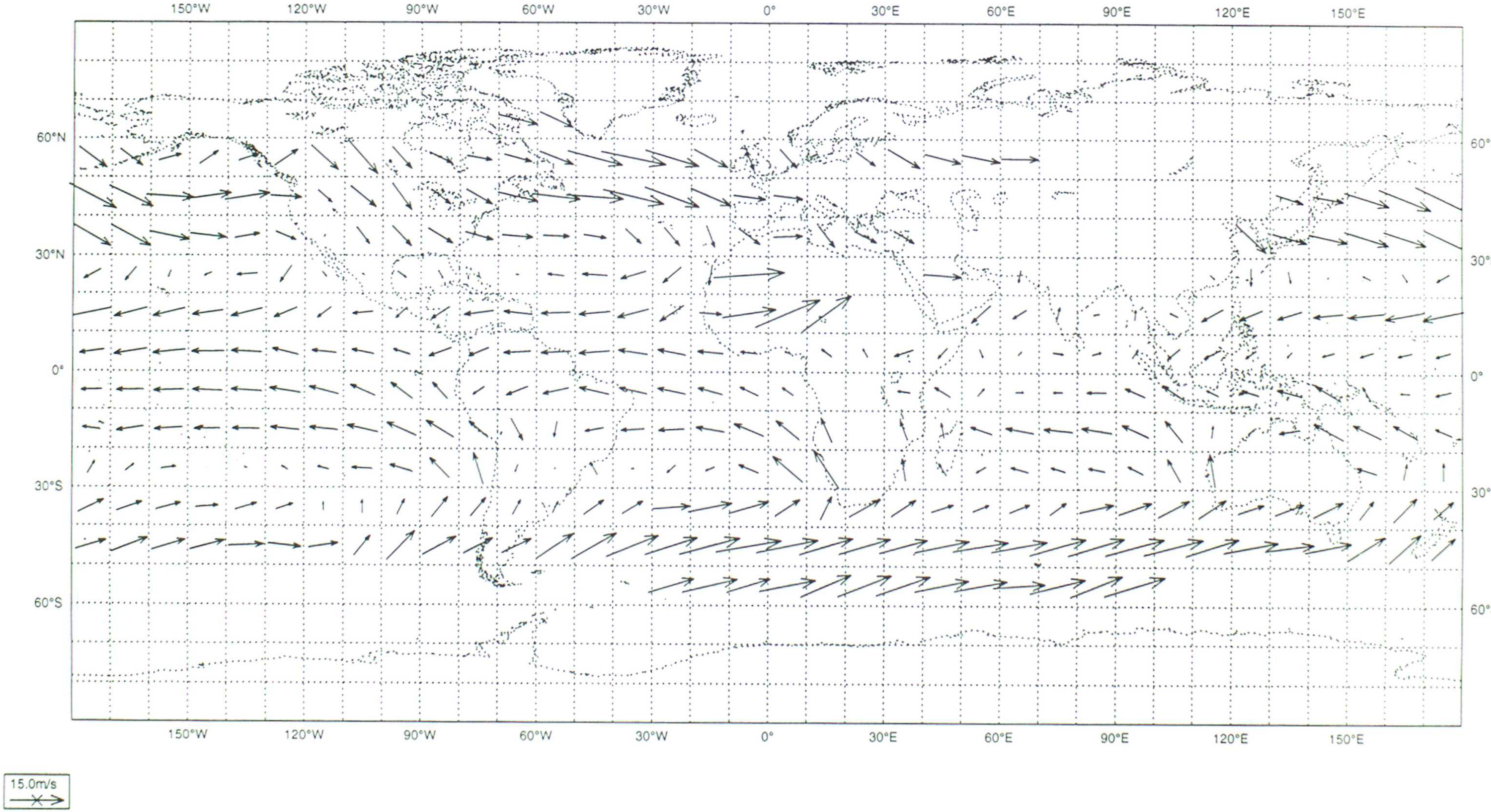

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 12. SATOB 701 - 1000 hPa vector wind differences. NOVEMBER 2002
All observations
Arrows are plotted where greater than 10 obs are present

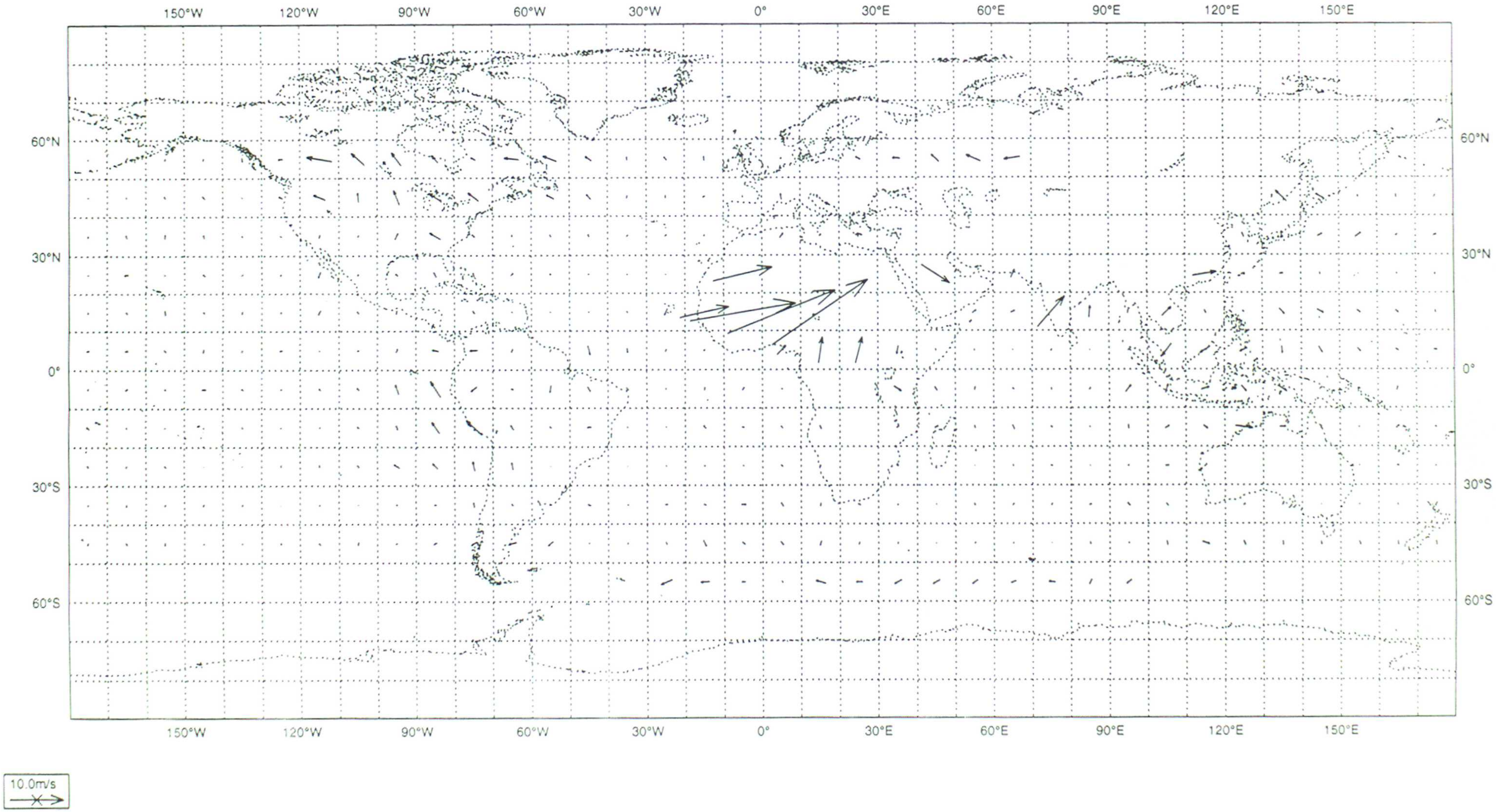

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). NOVEMBER 2002
All observations
Values are plotted where greater than 10 obs are present

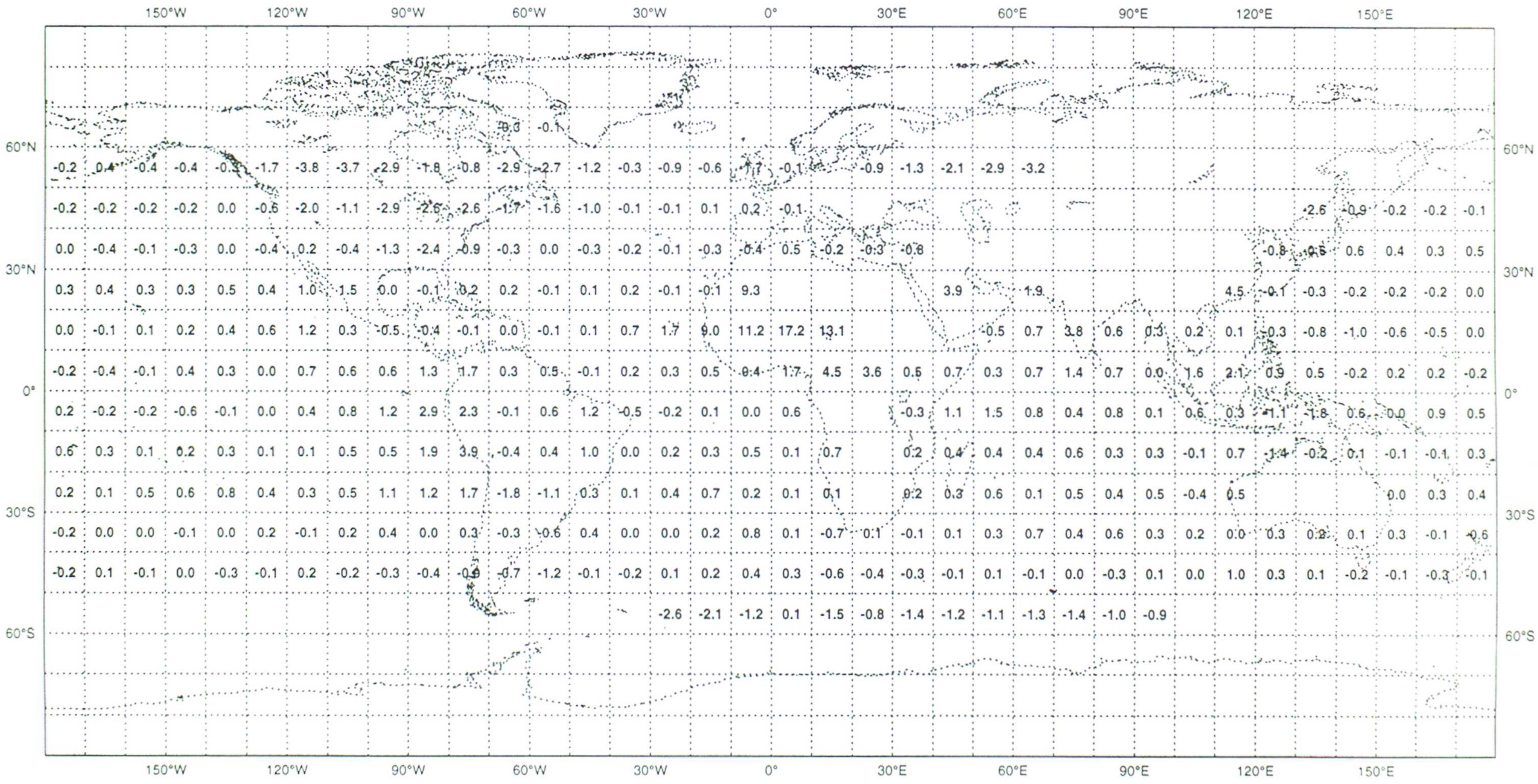

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0.3 -0.1
-0.2 0.4 -0.4 -0.4 -0.3 -1.7 -3.8 -3.7 -2.9 -1.8 -0.8 -2.9 -2.7 -1.2 -0.3 -0.9 -0.6 -1.7 -0.1 -0.9 -1.3 -2.1 -2.9 -3.2
-0.2 -0.2 -0.2 -0.2 0.0 -0.6 -2.0 -1.1 -2.9 -2.6 -2.6 -1.7 -1.6 -1.0 -0.1 -0.1 0.1 0.2 -0.1 -2.6 -0.9 -0.2 -0.2 -0.1
0.0 -0.4 -0.1 -0.3 0.0 -0.4 0.2 -0.4 -1.3 -2.4 -0.9 -0.3 0.0 -0.3 -0.2 -0.1 -0.3 -0.4 0.5 -0.2 -0.3 -0.8 -0.8 -0.5 0.6 0.4 0.3 0.5
0.3 0.4 0.3 0.3 0.5 0.4 1.0 1.5 0.0 -0.1 0.2 0.2 -0.1 0.1 0.2 -0.1 -0.1 9.3 3.9 1.9 4.5 -0.1 -0.3 -0.2 -0.2 -0.2 0.0
0.0 -0.1 0.1 0.2 0.4 0.6 1.2 0.3 -0.5 -0.4 -0.1 0.0 -0.1 0.1 0.7 1.7 9.0 11.2 17.2 13.1 -0.5 0.7 3.8 0.6 0.3 0.2 0.1 -0.3 -0.8 -1.0 -0.6 -0.5 0.0
-0.2 -0.4 -0.1 0.4 0.3 0.0 0.7 0.6 0.6 1.3 1.7 0.3 0.5 -0.1 0.2 0.3 0.5 0.4 1.7 4.5 3.6 0.5 0.7 0.3 0.7 1.4 0.7 0.0 1.6 2.1 0.9 0.5 -0.2 0.2 0.2 -0.2
0.2 -0.2 -0.2 -0.6 -0.1 0.0 0.4 0.8 1.2 2.9 2.3 -0.1 0.6 1.2 -0.5 -0.2 0.1 0.0 0.6 -0.3 1.1 1.5 0.8 0.4 0.8 0.1 0.6 0.3 -1.1 -1.8 0.6 0.0 0.9 0.5
0.6 0.3 0.1 0.2 0.3 0.1 0.1 0.5 0.5 1.9 3.9 -0.4 0.4 1.0 0.0 0.2 0.3 0.5 0.1 0.7 0.2 0.4 0.4 0.4 0.6 0.3 0.3 -0.1 0.7 -1.4 -0.2 0.1 -0.1 -0.1 0.3
0.2 0.1 0.5 0.6 0.8 0.4 0.3 0.5 1.1 1.2 1.7 -1.8 -1.1 0.3 0.1 0.4 0.7 0.2 0.1 0.1 0.2 0.3 0.6 0.1 0.5 0.4 0.5 -0.4 0.5 0.0 0.3 0.4
-0.2 0.0 0.0 -0.1 0.0 0.2 -0.1 0.2 0.4 0.0 0.3 -0.3 -0.6 0.4 0.0 0.0 0.2 0.8 0.1 -0.7 0.1 -0.1 0.1 0.3 0.7 0.4 0.6 0.3 0.2 0.0 0.3 0.2 0.1 0.3 -0.1 -0.6
-0.2 0.1 -0.1 0.0 -0.3 -0.1 0.2 -0.2 -0.3 -0.4 -0.9 -0.7 -1.2 -0.1 -0.2 0.1 0.2 0.4 0.3 -0.6 -0.4 -0.3 -0.1 0.1 -0.1 0.0 -0.3 0.1 0.0 1.0 0.3 0.1 -0.2 -0.1 -0.3 -0.1
-2.6 -2.1 -1.2 0.1 -1.5 -0.8 -1.4 -1.2 -1.1 -1.3 -1.4 -1.0 -0.9

Figure 14. SATOB 701 - 1000 hPa RMS O-B vector differences (ms-1). NOVEMBER 2002
All observations
Values are plotted where greater than 10 obs are present

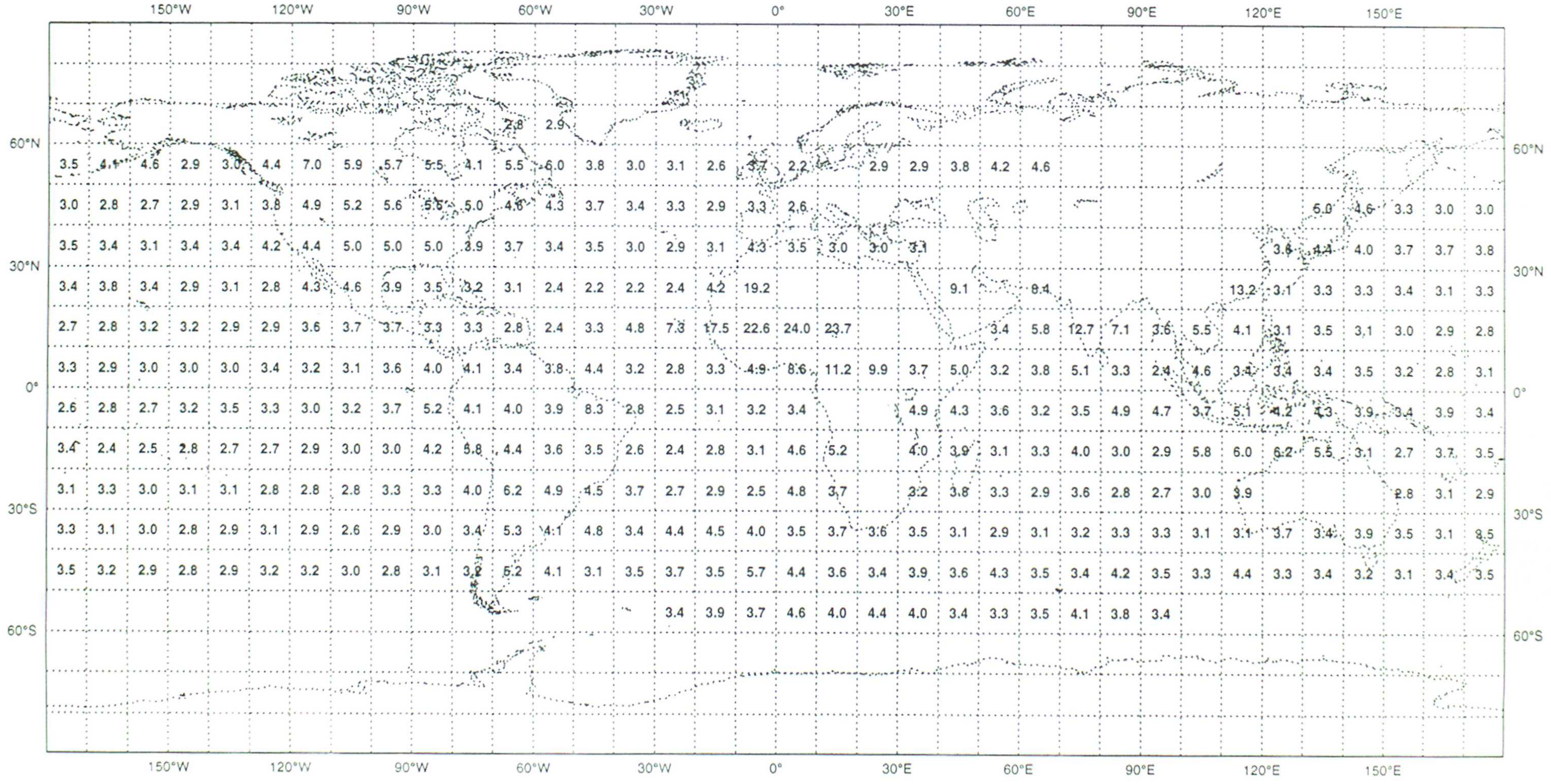

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2.8 2.9
3.5 4.1 4.6 2.9 3.0 4.4 7.0 5.9 5.7 5.5 4.1 5.5 6.0 3.8 3.0 3.1 2.6 3.7 2.2 2.9 2.9 3.8 4.2 4.6
3.0 2.8 2.7 2.9 3.1 3.8 4.9 5.2 5.6 5.6 5.0 4.6 4.3 3.7 3.4 3.3 2.9 3.3 2.6 6.0 4.6 3.3 3.0 3.0
3.5 3.4 3.1 3.4 3.4 4.2 4.4 5.0 5.0 5.0 3.9 3.7 3.4 3.5 3.0 2.9 3.1 4.3 3.5 3.0 3.0 3.1 3.6 4.4 4.0 3.7 3.7 3.8
3.4 3.8 3.4 2.9 3.1 2.8 4.3 4.6 3.9 3.5 3.2 3.1 2.4 2.2 2.2 2.4 4.2 19.2 9.1 8.4 13.2 3.1 3.3 3.3 3.4 3.1 3.3
2.7 2.8 3.2 3.2 2.9 2.9 3.6 3.7 3.7 3.3 3.3 2.8 2.4 3.3 4.8 7.3 17.5 22.6 24.0 23.7 3.4 5.8 12.7 7.1 3.6 5.5 4.1 3.1 3.5 3.1 3.0 2.9 2.8
3.3 2.9 3.0 3.0 3.0 3.4 3.2 3.1 3.6 4.0 4.1 3.4 3.8 4.4 3.2 2.8 3.3 4.9 8.6 11.2 9.9 3.7 5.0 3.2 3.8 5.1 3.3 2.4 4.6 3.4 3.4 3.4 3.5 3.2 2.8 3.1
2.6 2.8 2.7 3.2 3.5 3.3 3.0 3.2 3.7 5.2 4.1 4.0 3.9 8.3 2.8 2.5 3.1 3.2 3.4 4.9 4.3 3.6 3.2 3.5 4.9 4.7 3.7 5.1 4.2 4.3 3.9 3.4 3.9 3.4
3.4 2.4 2.5 2.8 2.7 2.7 2.9 3.0 3.0 4.2 5.8 4.4 3.6 3.5 2.6 2.4 2.8 3.1 4.6 5.2 4.0 3.9 3.1 3.3 4.0 3.0 2.9 5.8 6.0 6.2 5.5 3.1 2.7 3.7 3.5
3.1 3.3 3.0 3.1 3.1 2.8 2.8 2.8 3.3 3.3 4.0 6.2 4.9 4.5 3.7 2.7 2.9 2.5 4.8 3.7 3.2 3.8 3.3 2.9 3.6 2.8 2.7 3.0 3.9 2.8 3.1 2.9
3.3 3.1 3.0 2.8 2.9 3.1 2.9 2.6 2.9 3.0 3.4 5.3 4.1 4.8 3.4 4.4 4.5 4.0 3.5 3.7 3.6 3.5 3.1 2.9 3.1 3.2 3.3 3.3 3.1 3.1 3.7 3.4 3.9 3.5 3.1 3.5
3.5 3.2 2.9 2.8 2.9 3.2 3.2 3.0 2.8 3.1 3.2 5.2 4.1 3.1 3.5 3.7 3.5 5.7 4.4 3.6 3.4 3.9 3.6 4.3 3.5 3.4 4.2 3.5 3.3 4.4 3.3 3.4 3.2 3.1 3.4 3.5
3.4 3.9 3.7 4.6 4.0 4.4 4.0 3.4 3.3 3.5 4.1 3.8 3.4

Figure 15. SATOB 401 - 700 hPa mean daily count. NOVEMBER 2002
Global average number of observations in 24 hours = 16356

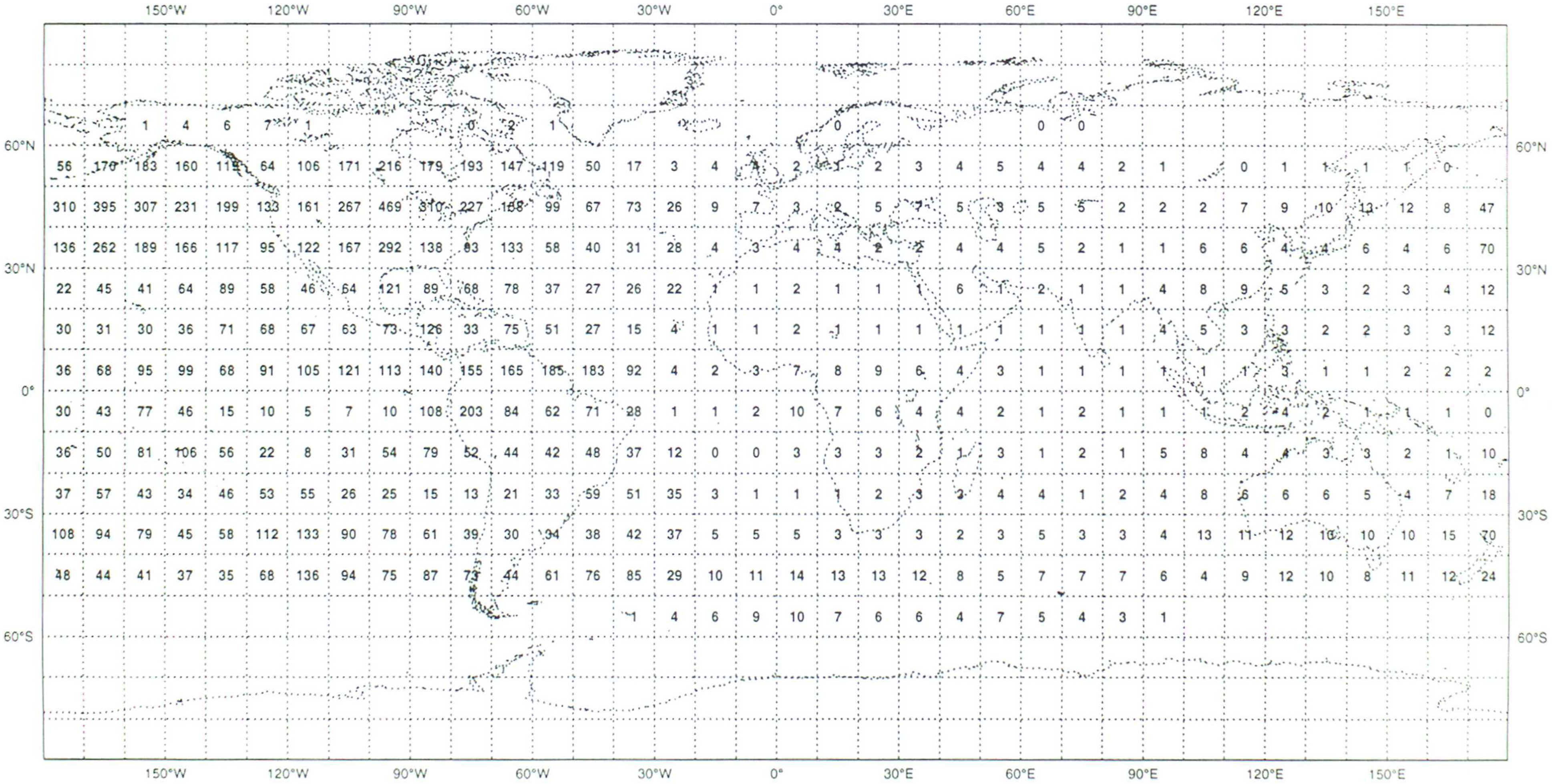

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 16. SATOB 401 - 700 hPa vector mean wind. NOVEMBER 2002
All observations
Arrows are plotted where greater than 10 obs are present

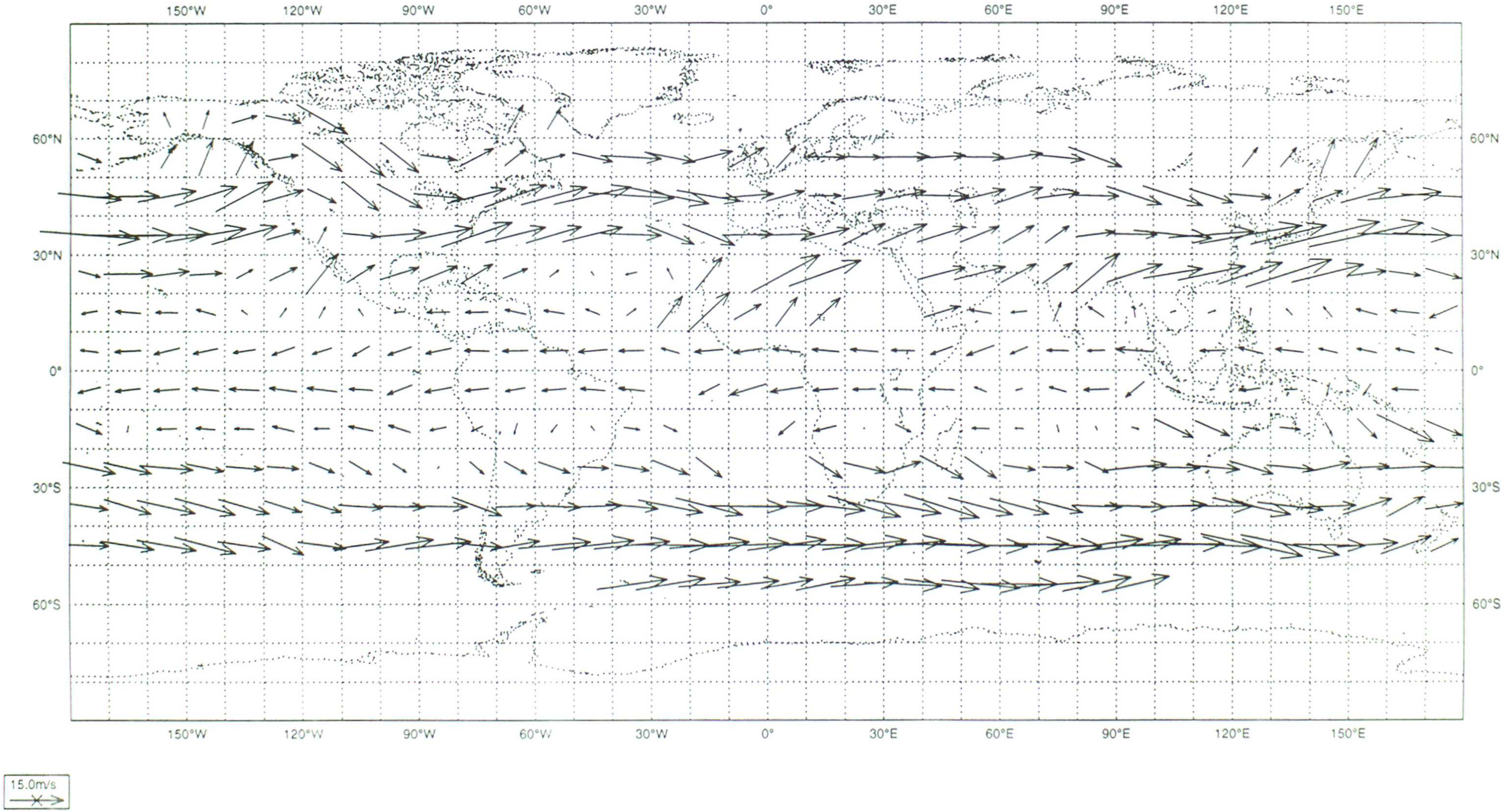

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 17. SATOB 401 - 700 hPa vector wind differences. NOVEMBER 2002
All observations
Arrows are plotted where greater than 10 obs are present

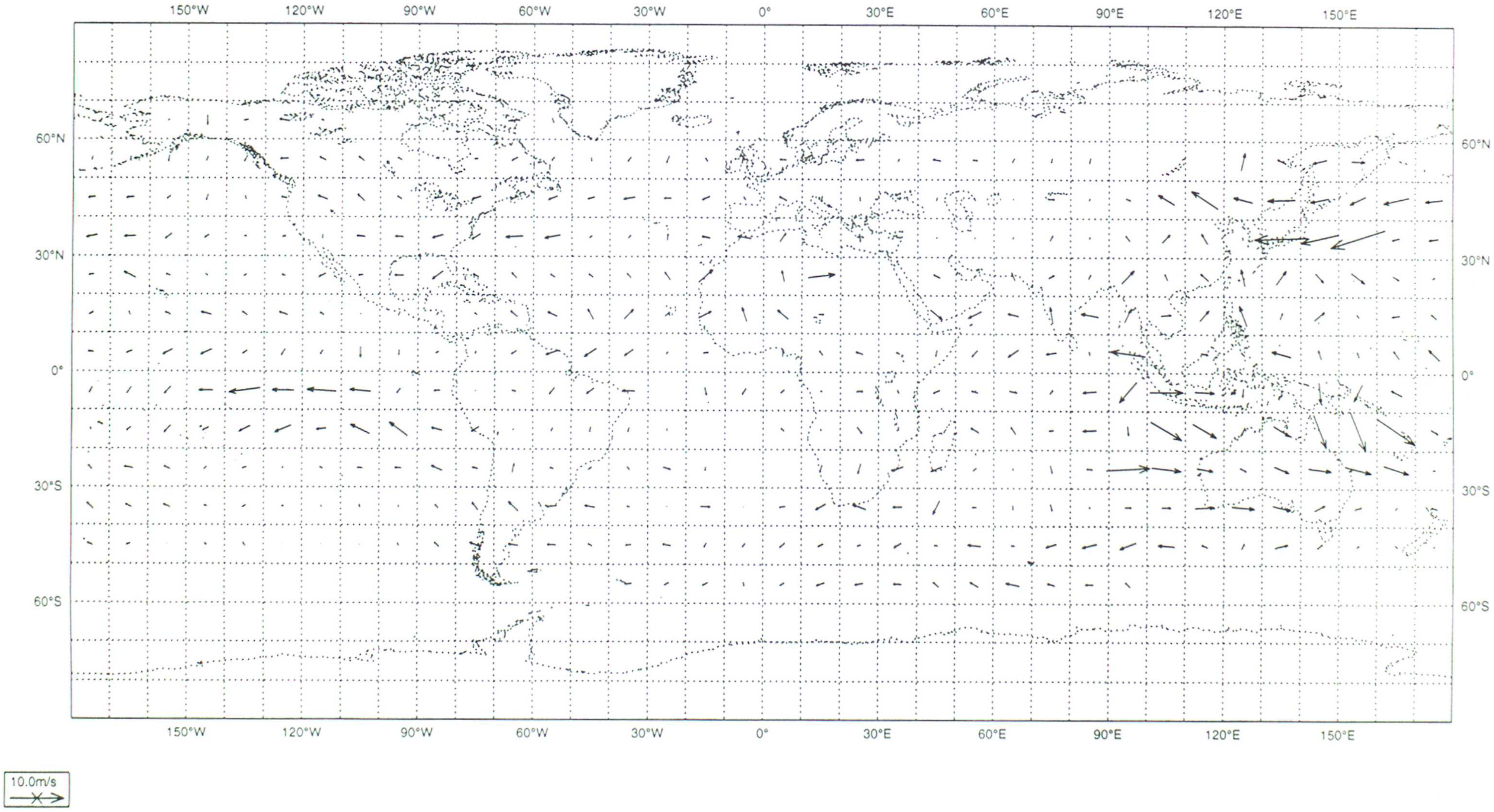

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). NOVEMBER 2002
All observations
Values are plotted where greater than 10 obs are present

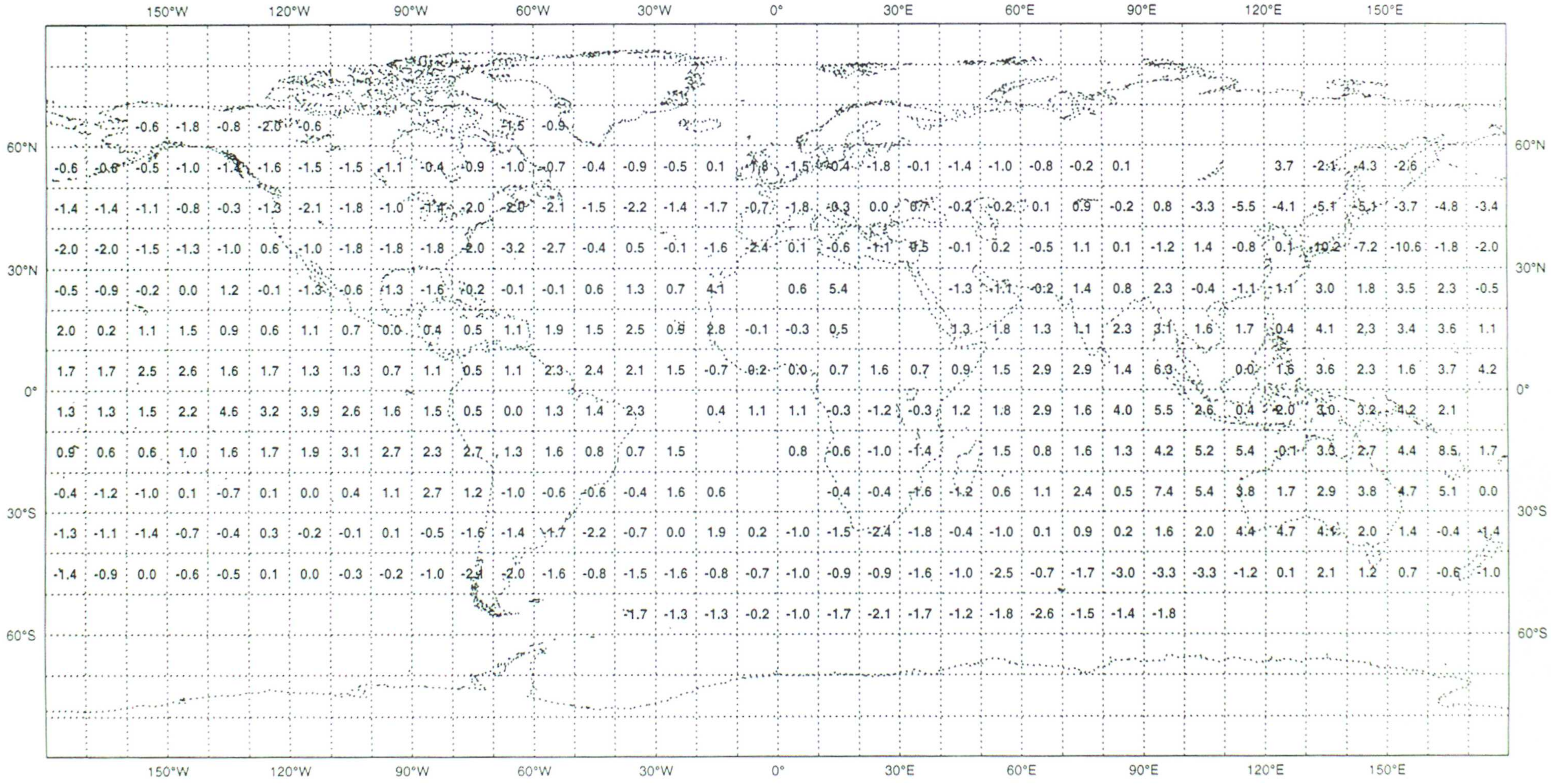

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-0.6 -1.8 -0.8 -2.0 -0.6 -1.5 -0.9
-0.6 -0.6 -0.5 -1.0 -1.1 -1.6 -1.5 -1.5 -1.1 -0.4 -0.9 -1.0 -0.7 -0.4 -0.9 -0.5 0.1 -1.8 -1.5 -0.4 -1.8 -0.1 -1.4 -1.0 -0.8 -0.2 0.1 3.7 -2.1 -4.3 -2.6
-1.4 -1.4 -1.1 -0.8 -0.3 -1.3 -2.1 -1.8 -1.0 -1.4 -2.0 -2.0 -2.1 -1.5 -2.2 -1.4 -1.7 -0.7 -1.8 -0.3 0.0 0.7 -0.2 -0.2 0.1 0.9 -0.2 0.8 -3.3 -5.5 -4.1 -5.1 -5.1 -3.7 -4.8 -3.4
-2.0 -2.0 -1.5 -1.3 -1.0 0.6 -1.0 -1.8 -1.8 -1.8 -2.0 -3.2 -2.7 -0.4 0.5 -0.1 -1.6 -2.4 0.1 -0.6 -1.1 0.5 -0.1 0.2 -0.5 1.1 0.1 -1.2 1.4 -0.8 0.1 -10.2 -7.2 -10.6 -1.8 -2.0
-0.5 -0.9 -0.2 0.0 1.2 -0.1 -1.3 -0.6 -1.3 -1.6 -0.2 -0.1 -0.1 0.6 1.3 0.7 4.1 0.6 5.4 -1.3 -1.1 -0.2 1.4 0.8 2.3 -0.4 -1.1 -1.1 3.0 1.8 3.5 2.3 -0.5
2.0 0.2 1.1 1.5 0.9 0.6 1.1 0.7 0.0 0.4 0.5 1.1 1.9 1.5 2.5 0.9 2.8 -0.1 -0.3 0.5 1.3 1.8 1.3 1.1 2.3 3.1 1.6 1.7 0.4 4.1 2.3 3.4 3.6 1.1
1.7 1.7 2.5 2.6 1.6 1.7 1.3 1.3 0.7 1.1 0.5 1.1 2.3 2.4 2.1 1.5 -0.7 0.2 0.0 0.7 1.6 0.7 0.9 1.5 2.9 2.9 1.4 6.3 0.0 1.6 3.6 2.3 1.6 3.7 4.2
1.3 1.3 1.5 2.2 4.6 3.2 3.9 2.6 1.6 1.5 0.5 0.0 1.3 1.4 2.3 0.4 1.1 1.1 -0.3 -1.2 -0.3 1.2 1.8 2.9 1.6 4.0 5.5 2.6 0.4 2.0 3.0 3.2 4.2 2.1
0.9 0.6 0.6 1.0 1.6 1.7 1.9 3.1 2.7 2.3 2.7 1.3 1.6 0.8 0.7 1.5 0.8 -0.6 -1.0 -1.4 1.5 0.8 1.6 1.3 4.2 5.2 5.4 -0.1 3.3 2.7 4.4 8.5 1.7
-0.4 -1.2 -1.0 0.1 -0.7 0.1 0.0 0.4 1.1 2.7 1.2 -1.0 -0.6 -0.6 -0.4 1.6 0.6 -0.4 -0.4 -1.6 -1.2 0.6 1.1 2.4 0.5 7.4 5.4 3.8 1.7 2.9 3.8 4.7 5.1 0.0
-1.3 -1.1 -1.4 -0.7 -0.4 0.3 -0.2 -0.1 0.1 -0.5 -1.6 -1.4 -1.7 -2.2 -0.7 0.0 1.9 0.2 -1.0 -1.5 -2.4 -1.8 -0.4 -1.0 0.1 0.9 0.2 1.6 2.0 4.4 4.7 4.6 2.0 1.4 -0.4 -1.4
-1.4 -0.9 0.0 -0.6 -0.5 0.1 0.0 -0.3 -0.2 -1.0 -2.4 -2.0 -1.6 -0.8 -1.5 -1.6 -0.8 -0.7 -1.0 -0.9 -0.9 -1.6 -1.0 -2.5 -0.7 -1.7 -3.0 -3.3 -3.3 -1.2 0.1 2.1 1.2 0.7 -0.6 -1.0
-1.7 -1.3 -1.3 -0.2 -1.0 -1.7 -2.1 -1.7 -1.2 -1.8 -2.6 -1.5 -1.4 -1.8

Figure 19. SATOB 401 - 700 hPa RMS O-B vector differences (ms-1). NOVEMBER 2002
All observations
Values are plotted where greater than 10 obs are present

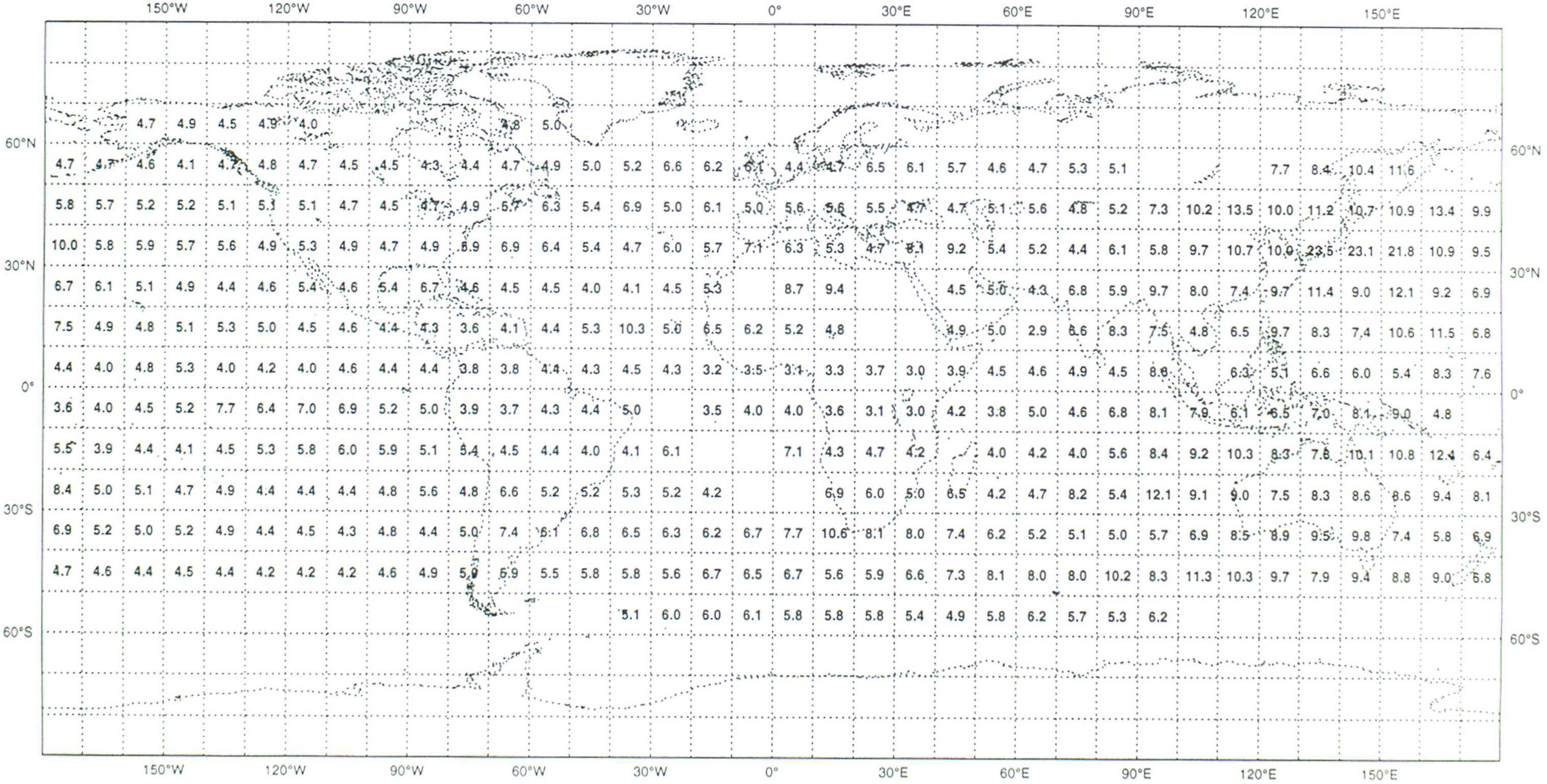
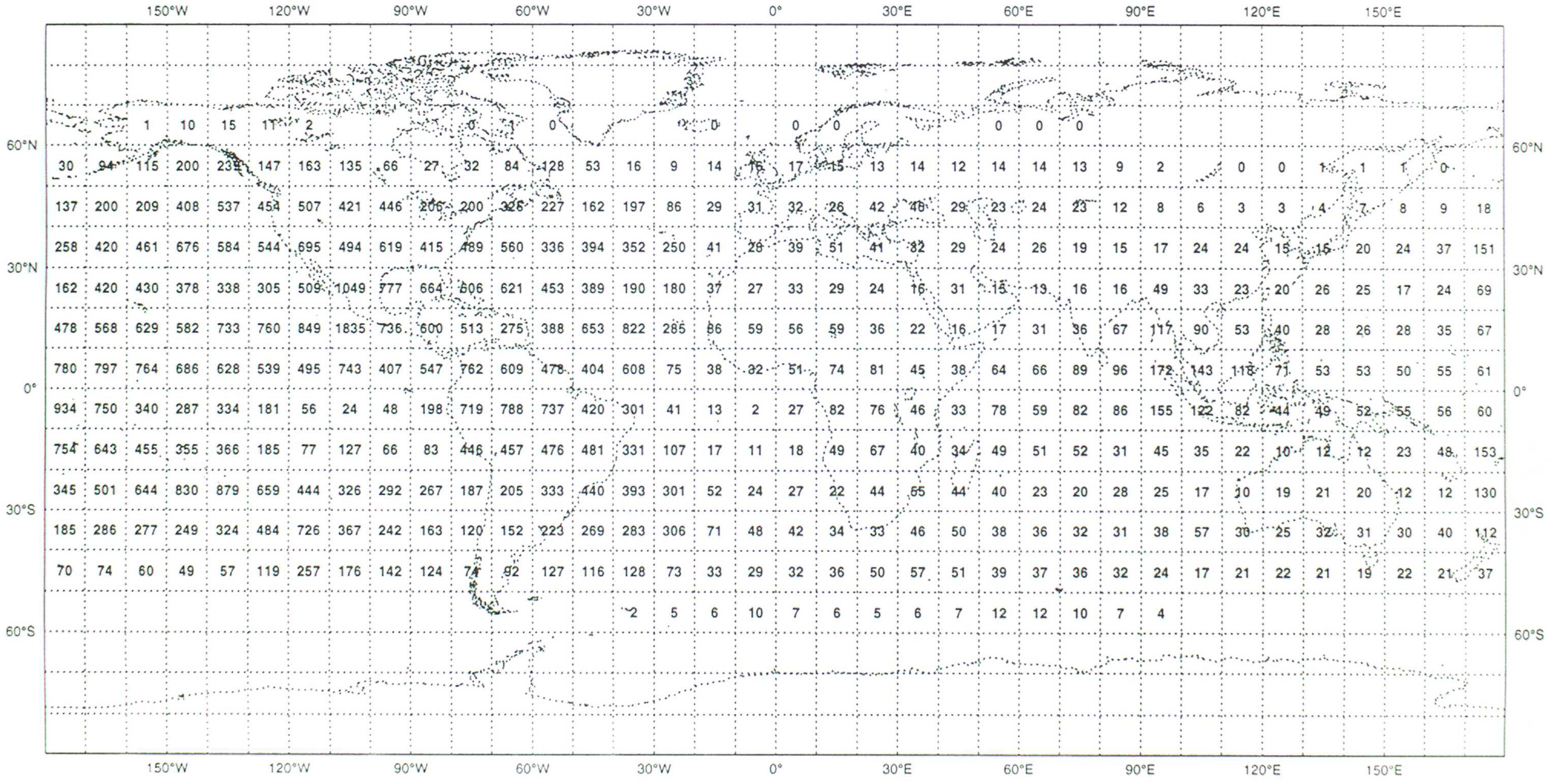

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4.7 4.9 4.5 4.9 4.0 4.8 5.0
4.7 4.7 4.6 4.1 4.7 4.8 4.7 4.5 4.5 4.3 4.4 4.7 4.9 5.0 5.2 6.6 6.2 6.1 4.4 4.7 6.5 6.1 5.7 4.6 4.7 5.3 5.1 7.7 8.4 10.4 11.6
5.8 5.7 5.2 5.2 5.1 5.1 5.1 4.7 4.5 4.7 4.9 5.7 6.3 5.4 6.9 5.0 6.1 5.0 5.6 5.6 5.5 4.7 4.7 5.1 5.6 4.8 5.2 7.3 10.2 13.5 10.0 11.2 10.7 10.9 13.4 9.9
10.0 5.8 5.9 5.7 5.6 4.9 5.3 4.9 4.7 4.9 6.9 6.9 6.4 5.4 4.7 6.0 5.7 7.1 6.3 5.3 4.7 8.1 9.2 5.4 5.2 4.4 6.1 5.8 9.7 10.7 10.0 23.5 23.1 21.8 10.9 9.5
6.7 6.1 5.1 4.9 4.4 4.6 5.4 4.6 5.4 6.7 4.6 4.5 4.5 4.0 4.1 4.5 5.3 8.7 9.4 4.5 5.0 4.3 6.8 5.9 9.7 8.0 7.4 9.7 11.4 9.0 12.1 9.2 6.9
7.5 4.9 4.8 5.1 5.3 5.0 4.5 4.6 4.4 4.3 3.6 4.1 4.4 5.3 10.3 5.0 6.5 6.2 5.2 4.8 4.9 5.0 2.9 6.6 8.3 7.5 4.8 6.5 9.7 8.3 7.4 10.6 11.5 6.8
4.4 4.0 4.8 5.3 4.0 4.2 4.0 4.6 4.4 4.4 3.8 3.8 4.4 4.3 4.5 4.3 3.2 3.5 3.1 3.3 3.7 3.0 3.9 4.5 4.6 4.9 4.5 8.6 6.3 5.1 6.6 6.0 5.4 8.3 7.6
3.6 4.0 4.5 5.2 7.7 6.4 7.0 6.9 5.2 5.0 3.9 3.7 4.3 4.4 5.0 3.5 4.0 4.0 3.6 3.1 3.0 4.2 3.8 5.0 4.6 6.8 8.1 7.9 6.1 6.5 7.0 8.1 9.0 4.8
5.5 3.9 4.4 4.1 4.5 5.3 5.8 6.0 5.9 5.1 5.4 4.5 4.4 4.0 4.1 6.1 7.1 4.3 4.7 4.2 4.0 4.2 4.0 5.6 8.4 9.2 10.3 8.3 7.8 10.1 10.8 12.4 6.4
8.4 5.0 5.1 4.7 4.9 4.4 4.4 4.4 4.8 5.6 4.8 6.6 5.2 5.2 5.3 5.2 4.2 6.9 6.0 5.0 6.5 4.2 4.7 8.2 5.4 12.1 9.1 9.0 7.5 8.3 8.6 8.6 9.4 8.1
6.9 5.2 5.0 5.2 4.9 4.4 4.5 4.3 4.8 4.4 5.0 7.4 6.1 6.8 6.5 6.3 6.2 6.7 7.7 10.6 8.1 8.0 7.4 6.2 5.2 5.1 5.0 5.7 6.9 8.5 8.9 9.5 9.8 7.4 5.8 6.9
4.7 4.6 4.4 4.5 4.4 4.2 4.2 4.2 4.6 4.9 5.9 5.9 5.5 5.8 5.8 5.6 6.7 6.5 6.7 5.6 5.9 6.6 7.3 8.1 8.0 8.0 10.2 8.3 11.3 10.3 9.7 7.9 9.4 8.8 9.0 6.8
5.1 6.0 6.0 6.1 5.8 5.8 5.8 5.4 4.9 5.8 6.2 5.7 5.3 6.2

Figure 20. SATOB 101 - 400 hPa mean daily count. NOVEMBER 2002
Global average number of observations in 24 hours = 74801



		1	10	15	11	2				0	1	0				0		0	0				0	0	0										
30	94	115	200	239	147	163	135	66	27	32	84	128	53	16	9	14	16	17	15	13	14	12	14	14	13	9	2		0	0	1	1	1	0	
137	200	209	408	537	454	507	421	446	206	200	326	227	162	197	86	29	31	32	26	42	46	29	23	24	23	12	8	6	3	3	4	7	8	9	18
258	420	461	676	584	544	695	494	619	415	489	560	336	394	352	250	41	28	39	51	41	82	29	24	26	19	15	17	24	24	15	15	20	24	37	151
162	420	430	378	338	305	509	1049	777	664	606	621	453	389	190	180	37	27	33	29	24	16	31	15	13	16	16	49	33	23	20	26	25	17	24	69
478	568	629	582	733	760	849	1835	736	600	513	275	388	653	822	285	86	59	56	59	36	22	16	17	31	36	67	117	90	53	40	28	26	28	35	67
780	797	764	686	628	539	495	743	407	547	762	609	478	404	608	75	38	32	51	74	81	45	38	64	66	89	96	172	143	118	71	53	53	50	55	61
934	750	340	287	334	181	56	24	48	198	719	788	737	420	301	41	13	2	27	82	76	46	33	78	59	82	86	155	122	82	44	49	52	55	56	60
754	643	455	355	366	185	77	127	66	83	446	457	476	481	331	107	17	11	18	49	67	40	34	49	51	52	31	45	35	22	10	12	12	23	48	153
345	501	644	830	879	659	444	326	292	267	187	205	333	440	393	301	52	24	27	22	44	65	44	40	23	20	28	25	17	10	19	21	20	12	12	130
185	286	277	249	324	484	726	367	242	163	120	152	223	269	283	306	71	48	42	34	33	46	50	38	36	32	31	38	57	30	25	32	31	30	40	112
70	74	60	49	57	119	257	176	142	124	74	92	127	116	128	73	33	29	32	36	50	57	51	39	37	36	32	24	17	21	22	21	19	22	21	37
														2	5	6	10	7	6	5	6	7	12	12	10	7	4								

Figure 21. SATOB 101 - 400 hPa vector mean wind. NOVEMBER 2002
All observations
Arrows are plotted where greater than 10 obs are present

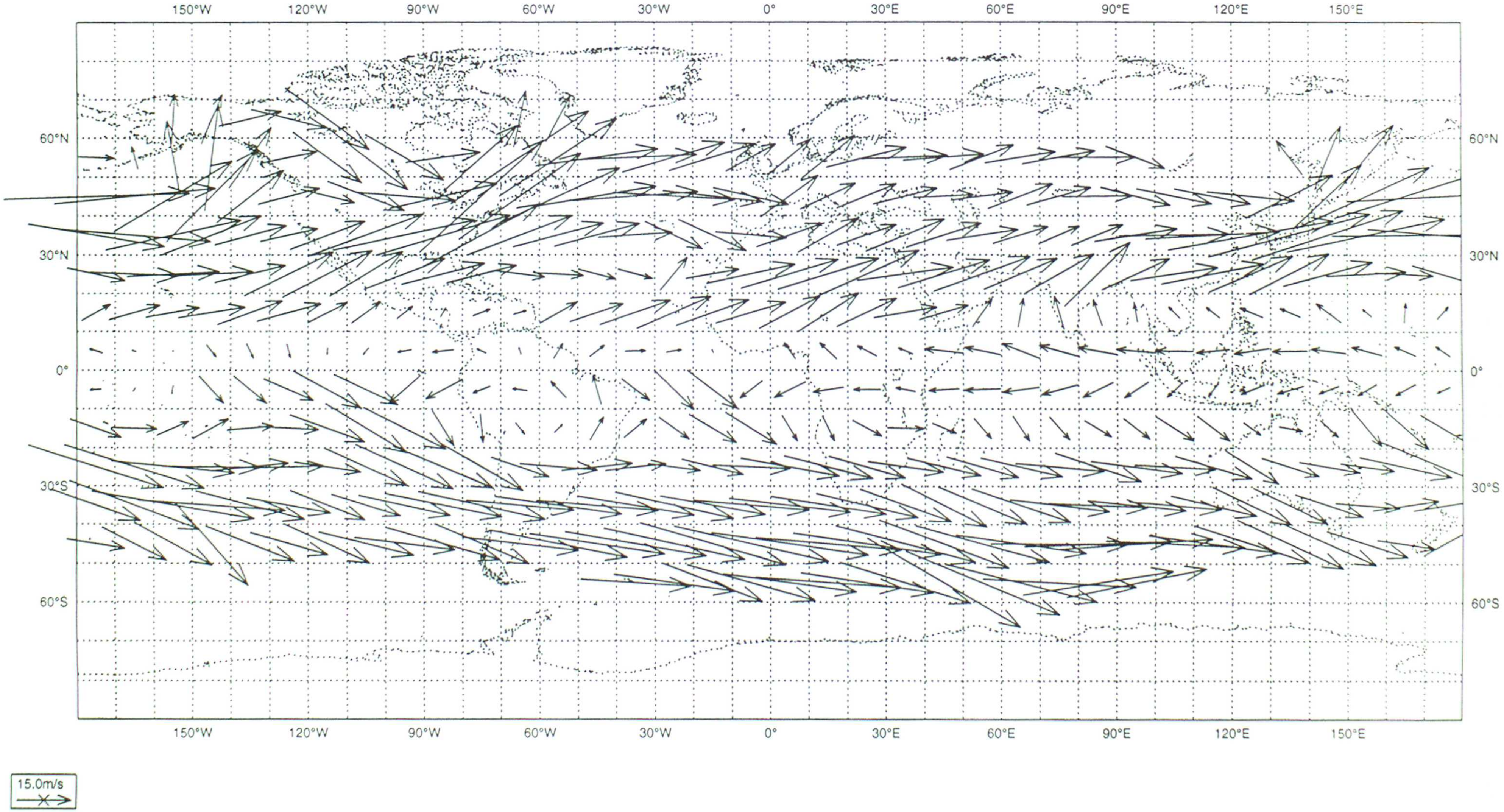

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 22. SATOB 101 - 400 hPa vector wind differences. NOVEMBER 2002
All observations
Arrows are plotted where greater than 10 obs are present

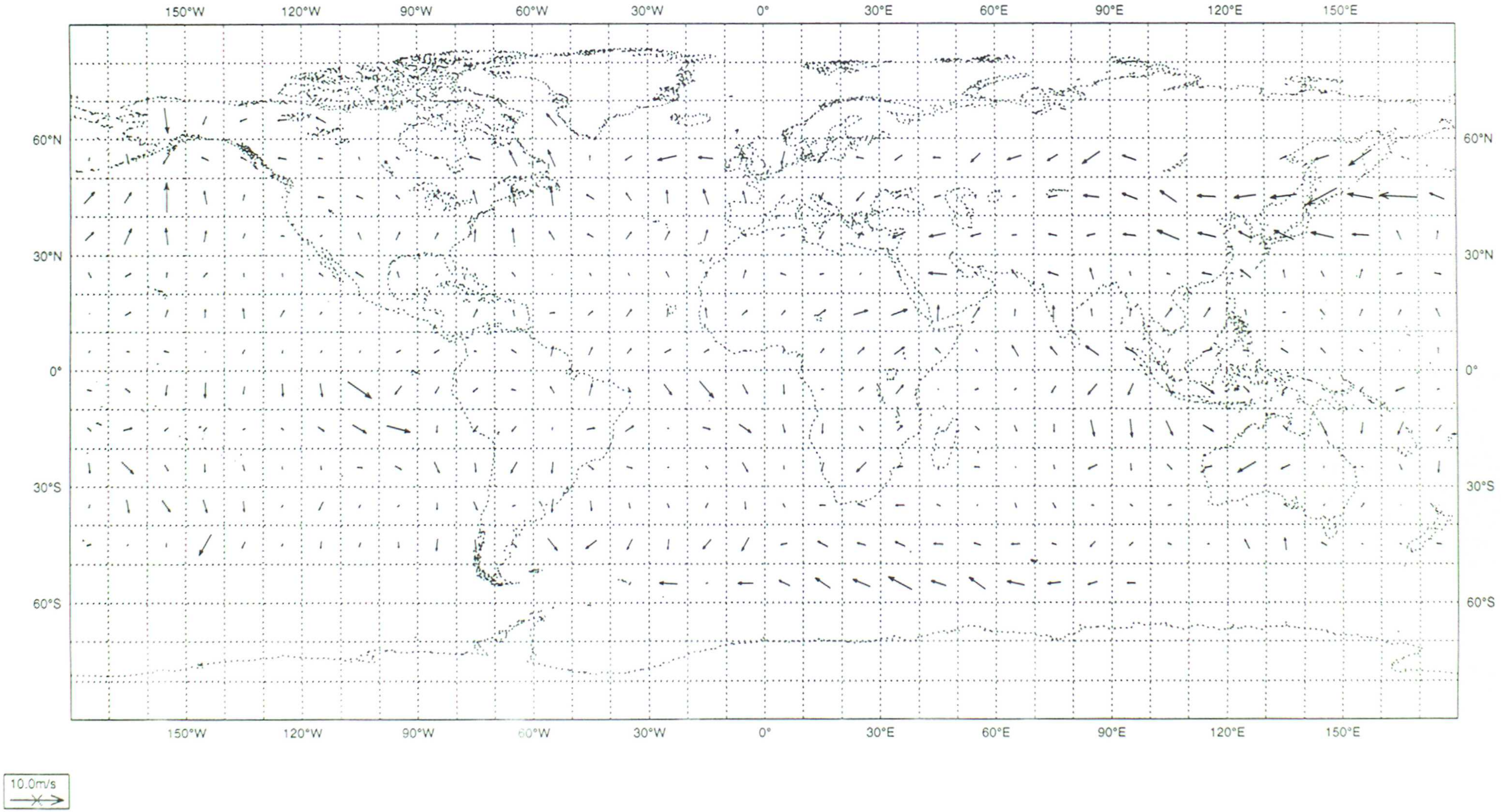

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). NOVEMBER 2002
All observations
Values are plotted where greater than 10 obs are present

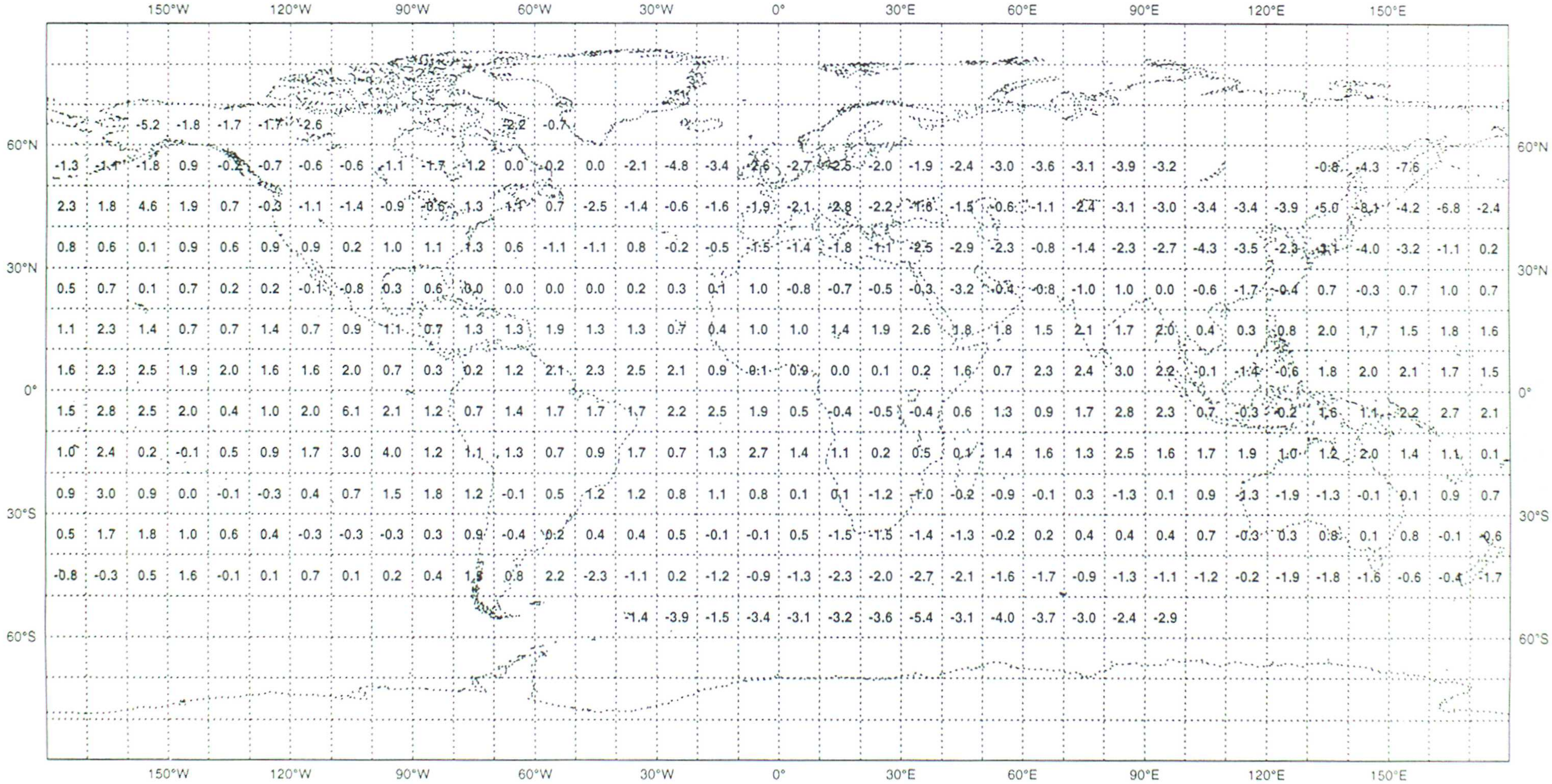
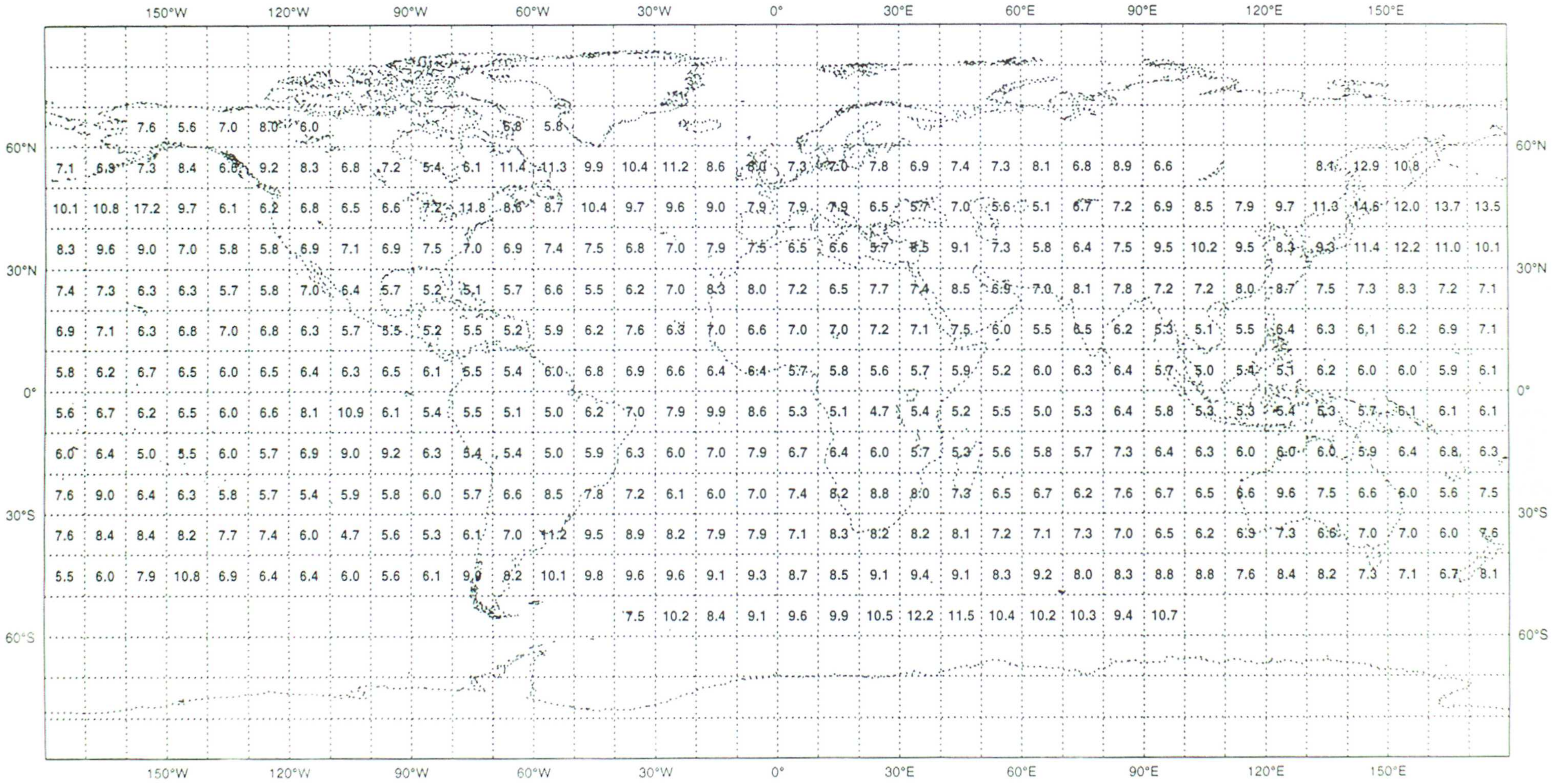

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-5.2 -1.8 -1.7 -1.7 -2.6 2.2 -0.7
-1.3 -1.1 -1.8 0.9 -0.2 -0.7 -0.6 -0.6 -1.1 -1.7 -1.2 0.0 -0.2 0.0 -2.1 -4.8 -3.4 -2.6 -2.7 -2.5 -2.0 -1.9 -2.4 -3.0 -3.6 -3.1 -3.9 -3.2 -0.8 -4.3 -7.6
2.3 1.8 4.6 1.9 0.7 -0.3 -1.1 -1.4 -0.9 -0.5 1.3 1.1 0.7 -2.5 -1.4 -0.6 -1.6 -1.9 -2.1 -2.8 -2.2 -1.8 -1.5 -0.6 -1.1 -2.4 -3.1 -3.0 -3.4 -3.4 -3.9 -5.0 -8.1 -4.2 -6.8 -2.4
0.8 0.6 0.1 0.9 0.6 0.9 0.9 0.2 1.0 1.1 1.3 0.6 -1.1 -1.1 0.8 -0.2 -0.5 -1.5 -1.4 -1.8 -1.1 -2.5 -2.9 -2.3 -0.8 -1.4 -2.3 -2.7 -4.3 -3.5 -2.3 -3.1 -4.0 -3.2 -1.1 0.2
0.5 0.7 0.1 0.7 0.2 0.2 -0.1 -0.8 0.3 0.6 0.0 0.0 0.0 0.0 0.2 0.3 0.1 1.0 -0.8 -0.7 -0.5 -0.3 -3.2 -0.4 -0.8 -1.0 1.0 0.0 -0.6 -1.7 -0.4 0.7 -0.3 0.7 1.0 0.7
1.1 2.3 1.4 0.7 0.7 1.4 0.7 0.9 1.1 0.7 1.3 1.3 1.9 1.3 1.3 0.7 0.4 1.0 1.0 1.4 1.9 2.6 1.8 1.8 1.5 2.1 1.7 2.0 0.4 0.3 0.8 2.0 1.7 1.5 1.8 1.6
1.6 2.3 2.5 1.9 2.0 1.6 1.6 2.0 0.7 0.3 0.2 1.2 2.1 2.3 2.5 2.1 0.9 0.1 0.9 0.0 0.1 0.2 1.6 0.7 2.3 2.4 3.0 2.2 -0.1 -1.4 -0.6 1.8 2.0 2.1 1.7 1.5
1.5 2.8 2.5 2.0 0.4 1.0 2.0 6.1 2.1 1.2 0.7 1.4 1.7 1.7 1.7 2.2 2.5 1.9 0.5 -0.4 -0.5 -0.4 0.6 1.3 0.9 1.7 2.8 2.3 0.7 -0.3 -0.2 1.6 1.1 2.2 2.7 2.1
1.0 2.4 0.2 -0.1 0.5 0.9 1.7 3.0 4.0 1.2 1.1 1.3 0.7 0.9 1.7 0.7 1.3 2.7 1.4 1.1 0.2 0.5 0.1 1.4 1.6 1.3 2.5 1.6 1.7 1.9 1.0 1.2 2.0 1.4 1.1 0.1
0.9 3.0 0.9 0.0 -0.1 -0.3 0.4 0.7 1.5 1.8 1.2 -0.1 0.5 1.2 1.2 0.8 1.1 0.8 0.1 0.1 -1.2 -1.0 -0.2 -0.9 -0.1 0.3 -1.3 0.1 0.9 -1.3 -1.9 -1.3 -0.1 0.1 0.9 0.7
0.5 1.7 1.8 1.0 0.6 0.4 -0.3 -0.3 -0.3 0.3 0.9 -0.4 0.2 0.4 0.4 0.5 -0.1 -0.1 0.5 -1.5 -1.5 -1.4 -1.3 -0.2 0.2 0.4 0.4 0.4 0.7 -0.3 0.3 0.8 0.1 0.8 -0.1 -0.6
-0.8 -0.3 0.5 1.6 -0.1 0.1 0.7 0.1 0.2 0.4 1.5 0.8 2.2 -2.3 -1.1 0.2 -1.2 -0.9 -1.3 -2.3 -2.0 -2.7 -2.1 -1.6 -1.7 -0.9 -1.3 -1.1 -1.2 -0.2 -1.9 -1.8 -1.6 -0.6 -0.4 -1.7
-1.4 -3.9 -1.5 -3.4 -3.1 -3.2 -3.6 -5.4 -3.1 -4.0 -3.7 -3.0 -2.4 -2.9

Figure 24. SATOB 101 - 400 hPa RMS O-B vector differences (ms-1). NOVEMBER 2002
All observations
Values are plotted where greater than 10 obs are present


150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
7.6 5.6 7.0 8.0 6.0 5.8 5.8
7.1 6.9 7.3 8.4 6.8 9.2 8.3 6.8 7.2 5.4 6.1 11.4 11.3 9.9 10.4 11.2 8.6 8.0 7.3 7.0 7.8 6.9 7.4 7.3 8.1 6.8 8.9 6.6 8.1 12.9 10.8
10.1 10.8 17.2 9.7 6.1 6.2 6.8 6.5 6.6 7.2 11.8 8.6 8.7 10.4 9.7 9.6 9.0 7.9 7.9 7.9 6.5 5.7 7.0 5.6 5.1 6.7 7.2 6.9 8.5 7.9 9.7 11.3 14.6 12.0 13.7 13.5
8.3 9.6 9.0 7.0 5.8 5.8 6.9 7.1 6.9 7.5 7.0 6.9 7.4 7.5 6.8 7.0 7.9 7.5 6.5 6.6 5.7 8.5 9.1 7.3 5.8 6.4 7.5 9.5 10.2 9.5 8.3 9.3 11.4 12.2 11.0 10.1
7.4 7.3 6.3 6.3 5.7 5.8 7.0 6.4 5.7 5.2 5.1 5.7 6.6 5.5 6.2 7.0 8.3 8.0 7.2 6.5 7.7 7.4 8.5 6.9 7.0 8.1 7.8 7.2 7.2 8.0 8.7 7.5 7.3 8.3 7.2 7.1
6.9 7.1 6.3 6.8 7.0 6.8 6.3 5.7 5.5 5.2 5.5 5.2 5.9 6.2 7.6 6.3 7.0 6.6 7.0 7.0 7.2 7.1 7.5 6.0 5.5 6.5 6.2 5.3 5.1 5.5 6.4 6.3 6.1 6.2 6.9 7.1
5.8 6.2 6.7 6.5 6.0 6.5 6.4 6.3 6.5 6.1 5.5 5.4 6.0 6.8 6.9 6.6 6.4 6.4 5.7 5.8 5.6 5.7 5.9 5.2 6.0 6.3 6.4 5.7 5.0 5.4 5.1 6.2 6.0 6.0 5.9 6.1
5.6 6.7 6.2 6.5 6.0 6.6 8.1 10.9 6.1 5.4 5.5 5.1 5.0 6.2 7.0 7.9 9.9 8.6 5.3 5.1 4.7 5.4 5.2 5.5 5.0 5.3 6.4 5.8 5.3 5.3 5.4 5.3 5.7 6.1 6.1 6.1
6.0 6.4 5.0 5.5 6.0 5.7 6.9 9.0 9.2 6.3 5.4 5.4 5.0 5.9 6.3 6.0 7.0 7.9 6.7 6.4 6.0 5.7 5.3 5.6 5.8 5.7 7.3 6.4 6.3 6.0 6.0 6.0 5.9 6.4 6.8 6.3
7.6 9.0 6.4 6.3 5.8 5.7 5.4 5.9 5.8 6.0 5.7 6.6 8.5 7.8 7.2 6.1 6.0 7.0 7.4 8.2 8.8 8.0 7.3 6.5 6.7 6.2 7.6 6.7 6.5 6.6 9.6 7.5 6.6 6.0 5.6 7.5
7.6 8.4 8.4 8.2 7.7 7.4 6.0 4.7 5.6 5.3 6.1 7.0 11.2 9.5 8.9 8.2 7.9 7.9 7.1 8.3 8.2 8.2 8.1 7.2 7.1 7.3 7.0 6.5 6.2 6.9 7.3 6.6 7.0 7.0 6.0 7.6
5.5 6.0 7.9 10.8 6.9 6.4 6.4 6.0 5.6 6.1 9.0 8.2 10.1 9.8 9.6 9.6 9.1 9.3 8.7 8.5 9.1 9.4 9.1 8.3 9.2 8.0 8.3 8.8 8.8 7.6 8.4 8.2 7.3 7.1 6.7 8.1
7.5 10.2 8.4 9.1 9.6 9.9 10.5 12.2 11.5 10.4 10.2 10.3 9.4 10.7

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: November 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-15 and NOAA-16.

Standard of comparison :Background field from UKMO global model.

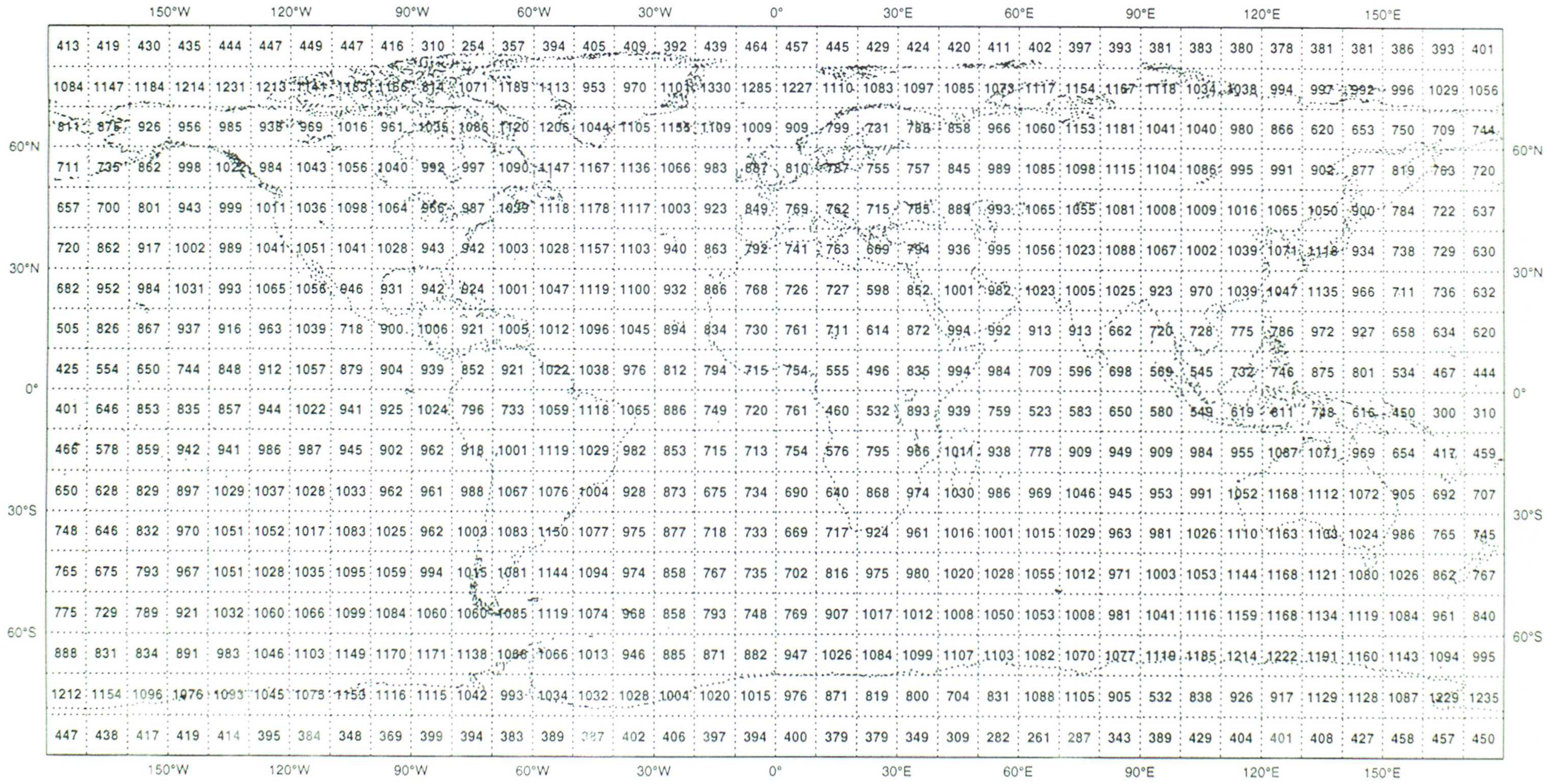
Selection Criteria :All soundings.

Data Extracted :Sounding channels (and approximate weighting function peaks, hPa)

HIRS8 (Surface)
HIRS15 (700)
HIRS11 (500-700)
HIRS4 (400)
AMSUA5 (700)
AMSUA7 (300)
AMSUA9 (100)

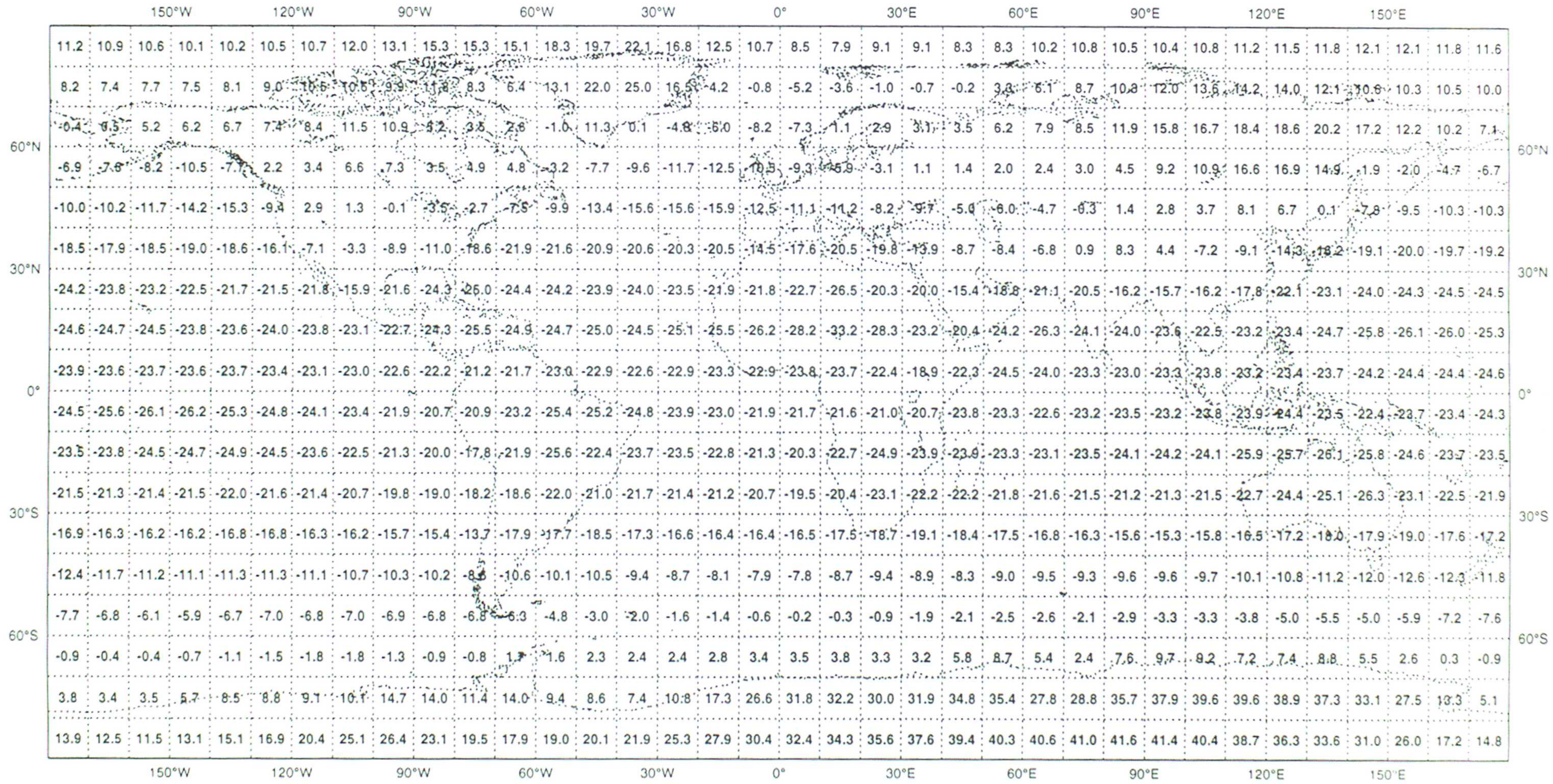
:Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. NOVEMBER 2002
NOAA15, using all observations
Global average number of observations in 24 hours = 565823



413	419	430	435	444	447	449	447	416	310	254	357	394	405	409	392	439	464	457	445	429	424	420	411	402	397	393	381	383	380	378	381	381	386	393	401
1084	1147	1184	1214	1231	1213	1141	1183	1156	814	1071	1189	1113	953	970	1101	1330	1285	1227	1110	1083	1097	1085	1073	1117	1154	1167	1118	1034	1038	994	997	992	996	1029	1056
811	876	926	956	985	938	969	1016	961	1035	1086	1120	1206	1044	1105	1155	1109	1009	909	799	731	788	858	966	1060	1153	1181	1041	1040	980	866	620	653	750	709	744
711	735	862	998	1022	984	1043	1056	1040	992	997	1090	1147	1167	1136	1066	983	887	810	787	755	757	845	989	1085	1098	1115	1104	1086	995	991	902	877	819	763	720
657	700	801	943	999	1011	1036	1098	1064	966	987	1039	1118	1178	1117	1003	923	849	769	762	715	785	889	993	1065	1055	1081	1008	1009	1016	1065	1050	900	784	722	637
720	862	917	1002	989	1041	1051	1041	1028	943	942	1003	1028	1157	1103	940	863	792	741	763	669	794	936	995	1056	1023	1088	1067	1002	1039	1071	1118	934	738	729	630
682	952	984	1031	993	1065	1056	946	931	942	924	1001	1047	1119	1100	932	866	768	726	727	598	852	1001	982	1023	1005	1025	923	970	1039	1047	1135	966	711	736	632
505	826	867	937	916	963	1039	718	900	1006	921	1005	1012	1096	1045	894	834	730	761	711	614	872	994	992	913	913	662	720	728	775	786	972	927	658	634	620
425	554	650	744	848	912	1057	879	904	939	852	921	1022	1038	976	812	794	715	754	555	496	835	994	984	709	596	698	569	545	732	746	875	801	534	467	444
401	646	853	835	857	944	1022	941	925	1024	796	733	1059	1118	1065	886	749	720	761	460	532	893	939	759	523	583	650	580	549	619	611	748	616	450	300	310
466	578	859	942	941	986	987	945	902	962	918	1001	1119	1029	982	853	715	713	754	576	795	986	1011	938	778	909	949	909	984	955	1087	1071	969	654	417	459
650	628	829	897	1029	1037	1028	1033	962	961	988	1067	1076	1004	928	873	675	734	690	640	868	974	1030	986	969	1046	945	953	991	1052	1168	1112	1072	905	692	707
748	646	832	970	1051	1052	1017	1083	1025	962	1003	1083	1150	1077	975	877	718	733	669	717	924	961	1016	1001	1015	1029	963	981	1026	1110	1163	1103	1024	986	765	745
765	675	793	967	1051	1028	1035	1095	1059	994	1015	1081	1144	1094	974	858	767	735	702	816	975	980	1020	1028	1055	1012	971	1003	1053	1144	1168	1121	1080	1026	862	767
775	729	789	921	1032	1060	1066	1099	1084	1060	1060	1085	1119	1074	968	858	793	748	769	907	1017	1012	1008	1050	1053	1008	981	1041	1116	1159	1168	1134	1119	1084	961	840
888	831	834	891	983	1046	1103	1149	1170	1171	1138	1066	1066	1013	946	885	871	882	947	1026	1084	1099	1107	1103	1082	1070	1077	1118	1185	1214	1222	1191	1160	1143	1094	995
1212	1154	1096	1076	1093	1045	1075	1153	1116	1115	1042	993	1034	1032	1028	1004	1020	1015	976	871	819	800	704	831	1088	1105	905	532	838	926	917	1129	1128	1087	1229	1235
447	438	417	419	414	395	384	348	369	399	394	383	389	387	402	406	397	394	400	379	379	349	309	282	261	287	343	389	429	404	401	408	427	458	457	450

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: HIRS8 (Surface)
NOAA15, using all observations



11.2	10.9	10.6	10.1	10.2	10.5	10.7	12.0	13.1	15.3	15.3	15.1	18.3	19.7	22.1	16.8	12.5	10.7	8.5	7.9	9.1	9.1	8.3	8.3	10.2	10.8	10.5	10.4	10.8	11.2	11.5	11.8	12.1	12.1	11.8	11.6
8.2	7.4	7.7	7.5	8.1	9.0	10.5	10.6	9.9	11.8	8.3	6.4	13.1	22.0	25.0	16.5	-4.2	-0.8	-5.2	-3.6	-1.0	-0.7	-0.2	3.3	6.1	8.7	10.8	12.0	13.6	14.2	14.0	12.1	10.6	10.3	10.5	10.0
-0.4	0.5	5.2	6.2	6.7	7.4	8.4	11.5	10.9	5.2	3.5	2.6	-1.0	11.3	0.1	-4.8	-6.0	-8.2	-7.3	1.1	2.9	3.1	3.5	6.2	7.9	8.5	11.9	15.8	16.7	18.4	18.6	20.2	17.2	12.2	10.2	7.1
-6.9	-7.6	-8.2	-10.5	-7.7	2.2	3.4	6.6	7.3	3.5	4.9	4.8	-3.2	-7.7	-9.6	-11.7	-12.5	-10.5	-9.3	-5.9	-3.1	1.1	1.4	2.0	2.4	3.0	4.5	9.2	10.9	16.6	16.9	14.9	-1.9	-2.0	-4.7	-6.7
-10.0	-10.2	-11.7	-14.2	-15.3	-9.4	2.9	1.3	-0.1	-3.5	-2.7	-7.5	-9.9	-13.4	-15.6	-15.6	-15.9	-12.5	-11.1	-11.2	-8.2	-9.7	-5.0	-6.0	-4.7	-6.3	1.4	2.8	3.7	8.1	6.7	0.1	-7.8	-9.5	-10.3	-10.3
-18.5	-17.9	-18.5	-19.0	-18.6	-16.1	-7.1	-3.3	-8.9	-11.0	-18.6	-21.9	-21.6	-20.9	-20.6	-20.3	-20.5	-14.5	-17.6	-20.5	-19.8	-13.9	-8.7	-8.4	-6.8	0.9	8.3	4.4	-7.2	-9.1	-14.3	-18.2	-19.1	-20.0	-19.7	-19.2
-24.2	-23.8	-23.2	-22.5	-21.7	-21.5	-21.8	-15.9	-21.6	-24.3	-26.0	-24.4	-24.2	-23.9	-24.0	-23.5	-21.9	-21.8	-22.7	-26.5	-20.3	-20.0	-15.4	-18.8	-21.1	-20.5	-16.2	-15.7	-16.2	-17.8	-22.1	-23.1	-24.0	-24.3	-24.5	-24.5
-24.6	-24.7	-24.5	-23.8	-23.6	-24.0	-23.8	-23.1	-22.7	-24.3	-25.5	-24.9	-24.7	-25.0	-24.5	-25.1	-25.5	-26.2	-28.2	-33.2	-28.3	-23.2	-20.4	-24.2	-26.3	-24.1	-24.0	-23.6	-22.5	-23.2	-23.4	-24.7	-25.8	-26.1	-26.0	-25.3
-23.9	-23.6	-23.7	-23.6	-23.7	-23.4	-23.1	-23.0	-22.6	-22.2	-21.2	-21.7	-23.0	-22.9	-22.6	-22.9	-23.3	-22.9	-23.8	-23.7	-22.4	-18.9	-22.3	-24.5	-24.0	-23.3	-23.0	-23.3	-23.8	-23.2	-23.4	-23.7	-24.2	-24.4	-24.4	-24.6
-24.5	-25.6	-26.1	-26.2	-25.3	-24.8	-24.1	-23.4	-21.9	-20.7	-20.9	-23.2	-25.4	-25.2	-24.8	-23.9	-23.0	-21.9	-21.7	-21.6	-21.0	-20.7	-23.8	-23.3	-22.6	-23.2	-23.5	-23.2	-23.8	-23.9	-24.4	-23.5	-22.4	-23.7	-23.4	-24.3
-23.5	-23.8	-24.5	-24.7	-24.9	-24.5	-23.6	-22.5	-21.3	-20.0	-17.8	-21.9	-25.6	-22.4	-23.7	-23.5	-22.8	-21.3	-20.3	-22.7	-24.9	-23.9	-23.9	-23.3	-23.1	-23.5	-24.1	-24.2	-24.1	-25.9	-25.7	-26.1	-25.8	-24.6	-23.7	-23.5
-21.5	-21.3	-21.4	-21.5	-22.0	-21.6	-21.4	-20.7	-19.8	-19.0	-18.2	-18.6	-22.0	-21.0	-21.7	-21.4	-21.2	-20.7	-19.5	-20.4	-23.1	-22.2	-22.2	-21.8	-21.6	-21.5	-21.2	-21.3	-21.5	-22.7	-24.4	-25.1	-26.3	-23.1	-22.5	-21.9
-16.9	-16.3	-16.2	-16.2	-16.8	-16.8	-16.3	-16.2	-15.7	-15.4	-13.7	-17.9	-17.7	-18.5	-17.3	-16.6	-16.4	-16.4	-16.5	-17.5	-18.7	-19.1	-18.4	-17.5	-16.8	-16.3	-15.6	-15.3	-15.8	-16.5	-17.2	-18.0	-17.9	-19.0	-17.6	-17.2
-12.4	-11.7	-11.2	-11.1	-11.3	-11.3	-11.1	-10.7	-10.3	-10.2	-8.6	-10.6	-10.1	-10.5	-9.4	-8.7	-8.1	-7.9	-7.8	-8.7	-9.4	-8.9	-8.3	-9.0	-9.5	-9.3	-9.6	-9.6	-9.7	-10.1	-10.8	-11.2	-12.0	-12.6	-12.3	-11.8
-7.7	-6.8	-6.1	-5.9	-6.7	-7.0	-6.8	-7.0	-6.9	-6.8	-6.8	-6.3	-4.8	-3.0	-2.0	-1.6	-1.4	-0.6	-0.2	-0.3	-0.9	-1.9	-2.1	-2.5	-2.6	-2.1	-2.9	-3.3	-3.3	-3.8	-5.0	-5.5	-5.0	-5.9	-7.2	-7.6
-0.9	-0.4	-0.4	-0.7	-1.1	-1.5	-1.8	-1.8	-1.3	-0.9	-0.8	1.7	1.6	2.3	2.4	2.4	2.8	3.4	3.5	3.8	3.3	3.2	5.8	8.7	5.4	2.4	7.6	9.7	9.2	7.2	7.4	8.8	5.5	2.6	0.3	-0.9
3.8	3.4	3.5	5.7	8.5	8.8	9.1	10.1	14.7	14.0	11.4	14.0	9.4	8.6	7.4	10.8	17.3	26.6	31.8	32.2	30.0	31.9	34.8	35.4	27.8	28.8	35.7	37.9	39.6	39.6	38.9	37.3	33.1	27.5	13.3	5.1
13.9	12.5	11.5	13.1	15.1	16.9	20.4	25.1	26.4	23.1	19.5	17.9	19.0	20.1	21.9	25.3	27.9	30.4	32.4	34.3	35.6	37.6	39.4	40.3	40.6	41.0	41.6	41.4	40.4	38.7	36.3	33.6	31.0	26.0	17.2	14.8

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: HIRS8 (Surface)
NOAA15, using all observations

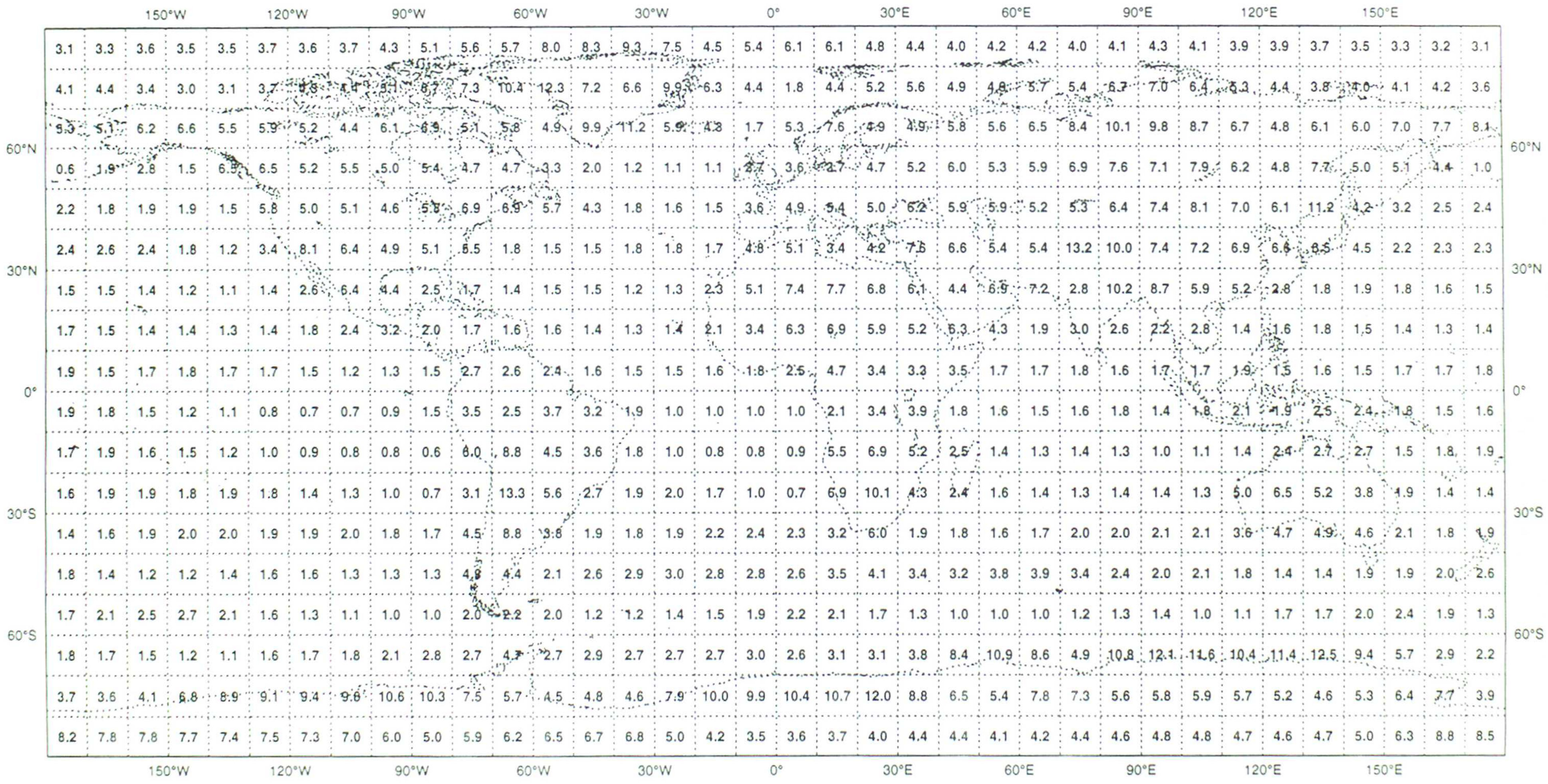

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
3.1 3.3 3.6 3.5 3.5 3.7 3.6 3.7 4.3 5.1 5.6 5.7 8.0 8.3 9.3 7.5 4.5 5.4 6.1 6.1 4.8 4.4 4.0 4.2 4.2 4.0 4.1 4.3 4.1 3.9 3.9 3.7 3.5 3.3 3.2 3.1
4.1 4.4 3.4 3.0 3.1 3.7 5.8 4.4 5.1 6.7 7.3 10.4 12.3 7.2 6.6 9.9 6.3 4.4 1.8 4.4 5.2 5.6 4.9 4.8 5.7 5.4 6.7 7.0 6.4 5.3 4.4 3.8 4.0 4.1 4.2 3.6
5.3 5.1 6.2 6.6 5.5 5.9 5.2 4.4 6.1 6.9 5.1 5.8 4.9 9.9 11.2 5.9 4.8 1.7 5.3 7.6 4.9 4.9 5.8 5.6 6.5 8.4 10.1 9.8 8.7 6.7 4.8 6.1 6.0 7.0 7.7 8.1
0.6 1.9 2.8 1.5 6.5 6.5 5.2 5.5 5.0 5.4 4.7 4.7 3.3 2.0 1.2 1.1 1.1 2.7 3.6 2.7 4.7 5.2 6.0 5.3 5.9 6.9 7.6 7.1 7.9 6.2 4.8 7.7 5.0 5.1 4.4 1.0
2.2 1.8 1.9 1.9 1.5 5.8 5.0 5.1 4.6 5.8 6.9 6.9 5.7 4.3 1.8 1.6 1.5 3.6 4.9 5.4 5.0 6.2 5.9 5.9 5.2 5.3 6.4 7.4 8.1 7.0 6.1 11.2 4.2 3.2 2.5 2.4
2.4 2.6 2.4 1.8 1.2 3.4 8.1 6.4 4.9 5.1 6.5 1.8 1.5 1.5 1.8 1.8 1.7 4.8 5.1 3.4 4.2 7.5 6.6 5.4 5.4 13.2 10.0 7.4 7.2 6.9 6.6 8.5 4.5 2.2 2.3 2.3
1.5 1.5 1.4 1.2 1.1 1.4 2.6 6.4 4.4 2.5 1.7 1.4 1.5 1.5 1.2 1.3 2.3 5.1 7.4 7.7 6.8 6.1 4.4 6.9 7.2 2.8 10.2 8.7 5.9 5.2 2.8 1.8 1.9 1.8 1.6 1.5
1.7 1.5 1.4 1.4 1.3 1.4 1.8 2.4 3.2 2.0 1.7 1.6 1.6 1.4 1.3 1.4 2.1 3.4 6.3 6.9 5.9 5.2 6.3 4.3 1.9 3.0 2.6 2.2 2.8 1.4 1.6 1.8 1.5 1.4 1.3 1.4
1.9 1.5 1.7 1.8 1.7 1.7 1.5 1.2 1.3 1.5 2.7 2.6 2.4 1.6 1.5 1.5 1.6 1.8 2.5 4.7 3.4 3.3 3.5 1.7 1.7 1.8 1.6 1.7 1.7 1.9 1.5 1.6 1.5 1.7 1.7 1.8
1.9 1.8 1.5 1.2 1.1 0.8 0.7 0.7 0.9 1.5 3.5 2.5 3.7 3.2 1.9 1.0 1.0 1.0 1.0 2.1 3.4 3.9 1.8 1.6 1.5 1.6 1.8 1.4 1.8 2.1 1.9 2.5 2.4 1.8 1.5 1.6
1.7 1.9 1.6 1.5 1.2 1.0 0.9 0.8 0.8 0.6 6.0 8.8 4.5 3.6 1.8 1.0 0.8 0.8 0.9 5.5 6.9 5.2 2.5 1.4 1.3 1.4 1.3 1.0 1.1 1.4 2.4 2.7 2.7 1.5 1.8 1.9
1.6 1.9 1.9 1.8 1.9 1.8 1.4 1.3 1.0 0.7 3.1 13.3 5.6 2.7 1.9 2.0 1.7 1.0 0.7 6.9 10.1 4.3 2.4 1.6 1.4 1.3 1.4 1.4 1.3 5.0 6.5 5.2 3.8 1.9 1.4 1.4
1.4 1.6 1.9 2.0 2.0 1.9 1.9 2.0 1.8 1.7 4.5 8.8 3.8 1.9 1.8 1.9 2.2 2.4 2.3 3.2 6.0 1.9 1.8 1.6 1.7 2.0 2.0 2.1 2.1 3.6 4.7 4.9 4.6 2.1 1.8 1.9
1.8 1.4 1.2 1.2 1.4 1.6 1.6 1.3 1.3 1.3 4.8 4.4 2.1 2.6 2.9 3.0 2.8 2.8 2.6 3.5 4.1 3.4 3.2 3.8 3.9 3.4 2.4 2.0 2.1 1.8 1.4 1.4 1.9 1.9 2.0 2.6
1.7 2.1 2.5 2.7 2.1 1.6 1.3 1.1 1.0 1.0 2.0 2.2 2.0 1.2 1.2 1.4 1.5 1.9 2.2 2.1 1.7 1.3 1.0 1.0 1.0 1.2 1.3 1.4 1.0 1.1 1.7 1.7 2.0 2.4 1.9 1.3
1.8 1.7 1.5 1.2 1.1 1.6 1.7 1.8 2.1 2.8 2.7 4.7 2.7 2.9 2.7 2.7 2.7 3.0 2.6 3.1 3.1 3.8 8.4 10.9 8.6 4.9 10.8 12.1 11.6 10.4 11.4 12.5 9.4 5.7 2.9 2.2
3.7 3.6 4.1 6.8 8.9 9.1 9.4 9.6 10.6 10.3 7.5 5.7 4.5 4.8 4.6 7.9 10.0 9.9 10.4 10.7 12.0 8.8 6.5 5.4 7.8 7.3 5.6 5.8 5.9 5.7 5.2 4.6 5.3 6.4 7.7 3.9
8.2 7.8 7.8 7.7 7.4 7.5 7.3 7.0 6.0 5.0 5.9 6.2 6.5 6.7 6.8 5.0 4.2 3.5 3.6 3.7 4.0 4.4 4.4 4.1 4.2 4.4 4.6 4.8 4.8 4.7 4.6 4.7 5.0 6.3 8.8 8.5
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: HIRS15 (700 hPa)
NOAA15, using all observations

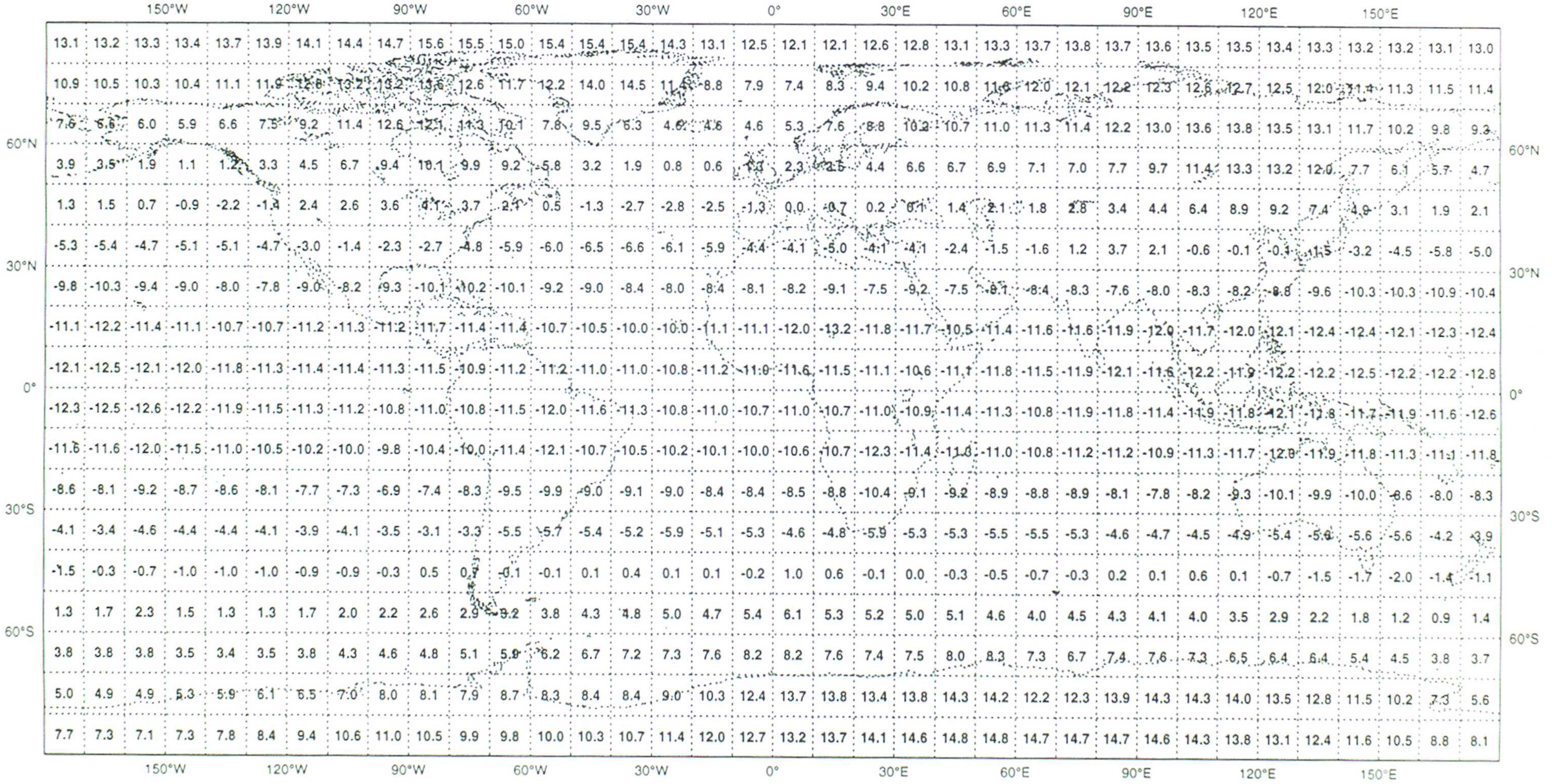
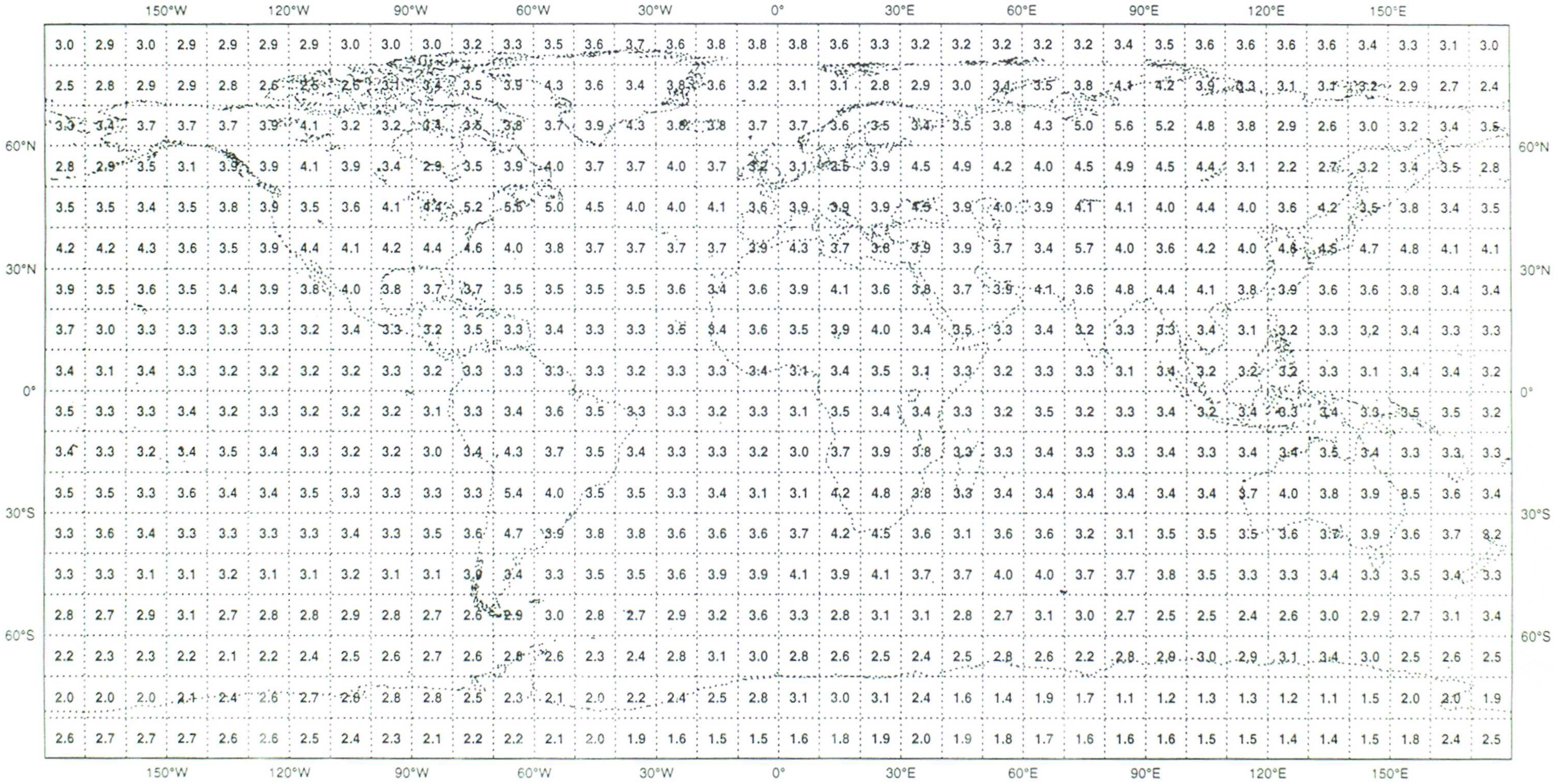
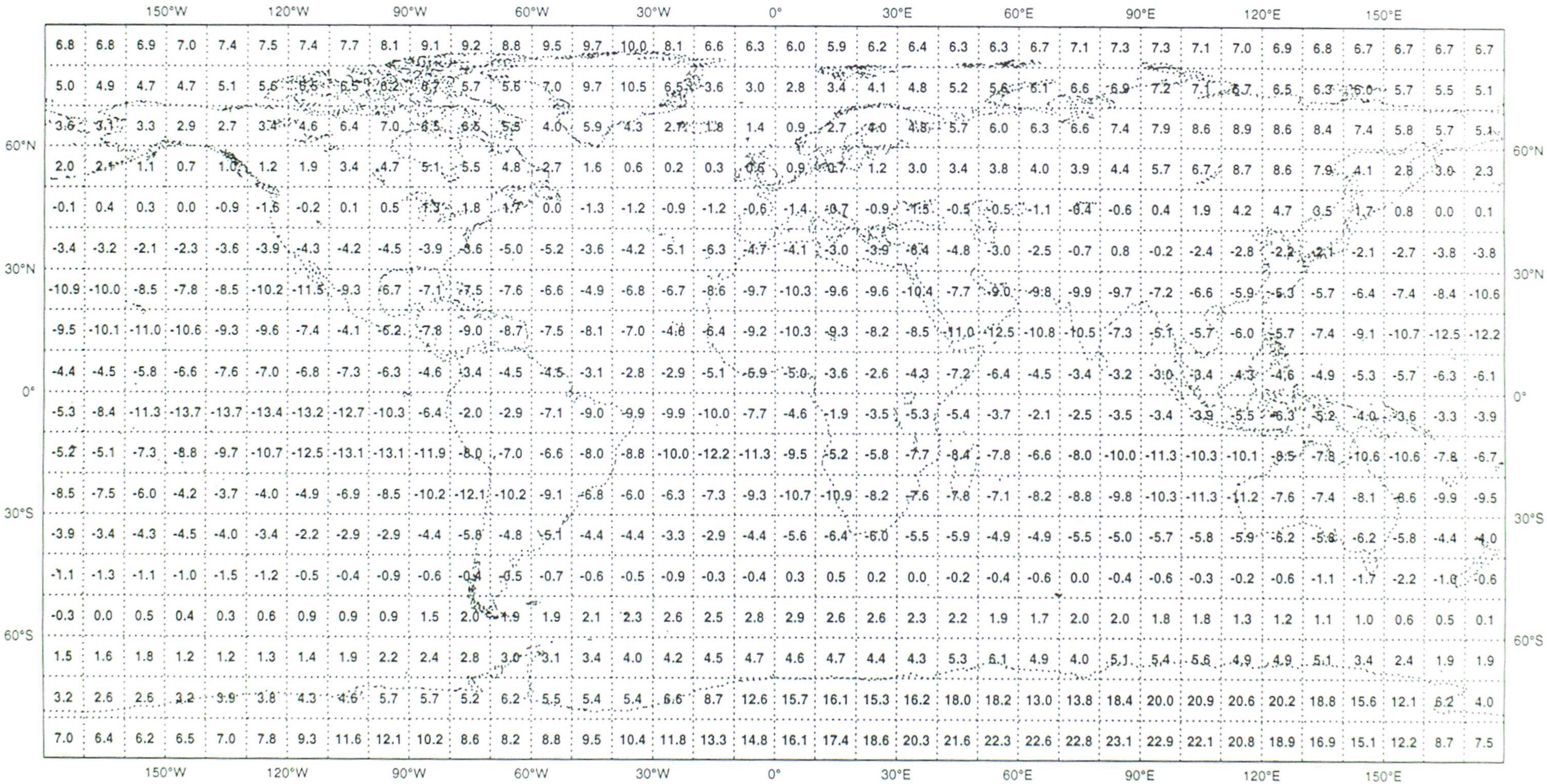

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
13.1 13.2 13.3 13.4 13.7 13.9 14.1 14.4 14.7 15.6 15.5 15.0 15.4 15.4 15.4 14.3 13.1 12.5 12.1 12.1 12.6 12.8 13.1 13.3 13.7 13.8 13.7 13.6 13.5 13.5 13.4 13.3 13.2 13.2 13.1 13.0
10.9 10.5 10.3 10.4 11.1 11.9 12.8 13.2 13.2 13.6 12.6 11.7 12.2 14.0 14.5 11.4 8.8 7.9 7.4 8.3 9.4 10.2 10.8 11.6 12.0 12.1 12.2 12.3 12.6 12.7 12.5 12.0 11.4 11.3 11.5 11.4
7.6 6.6 6.0 5.9 6.6 7.5 9.2 11.4 12.6 12.1 11.3 10.1 7.8 9.5 6.3 4.6 4.6 4.6 5.3 7.6 8.8 10.2 10.7 11.0 11.3 11.4 12.2 13.0 13.6 13.8 13.5 13.1 11.7 10.2 9.8 9.3
3.9 3.5 1.9 1.1 1.2 3.3 4.5 6.7 9.4 10.1 9.9 9.2 5.8 3.2 1.9 0.8 0.6 1.3 2.3 2.5 4.4 6.6 6.7 6.9 7.1 7.0 7.7 9.7 11.4 13.3 13.2 12.0 7.7 6.1 5.7 4.7
1.3 1.5 0.7 -0.9 -2.2 -1.4 2.4 2.6 3.6 4.1 3.7 2.1 0.5 -1.3 -2.7 -2.8 -2.5 -1.3 0.0 -0.7 0.2 0.1 1.4 2.1 1.8 2.8 3.4 4.4 6.4 8.9 9.2 7.4 4.9 3.1 1.9 2.1
-5.3 -5.4 -4.7 -5.1 -5.1 -4.7 -3.0 -1.4 -2.3 -2.7 -4.8 -5.9 -6.0 -6.5 -6.6 -6.1 -5.9 -4.4 -4.1 -5.0 -4.1 -4.1 -2.4 -1.5 -1.6 1.2 3.7 2.1 -0.6 -0.1 -0.1 -1.5 -3.2 -4.5 -5.8 -5.0
-9.8 -10.3 -9.4 -9.0 -8.0 -7.8 -9.0 -8.2 -9.3 -10.1 -10.2 -10.1 -9.2 -9.0 -8.4 -8.0 -8.4 -8.1 -8.2 -9.1 -7.5 -9.2 -7.5 -8.1 -8.4 -8.3 -7.6 -8.0 -8.3 -8.2 -8.8 -9.6 -10.3 -10.3 -10.9 -10.4
-11.1 -12.2 -11.4 -11.1 -10.7 -10.7 -11.2 -11.3 -11.2 -11.7 -11.4 -11.4 -10.7 -10.5 -10.0 -10.0 -11.1 -11.1 -12.0 -13.2 -11.8 -11.7 -10.5 -11.4 -11.6 -11.6 -11.9 -12.0 -11.7 -12.0 -12.1 -12.4 -12.4 -12.1 -12.3 -12.4
-12.1 -12.5 -12.1 -12.0 -11.8 -11.3 -11.4 -11.4 -11.3 -11.5 -10.9 -11.2 -11.2 -11.0 -11.0 -10.8 -11.2 -11.0 -11.6 -11.5 -11.1 -10.6 -11.1 -11.8 -11.5 -11.9 -12.1 -11.6 -12.2 -11.9 -12.2 -12.2 -12.5 -12.2 -12.2 -12.8
-12.3 -12.5 -12.6 -12.2 -11.9 -11.5 -11.3 -11.2 -10.8 -11.0 -10.8 -11.5 -12.0 -11.6 -11.3 -10.8 -11.0 -10.7 -11.0 -10.7 -11.0 -10.9 -11.4 -11.3 -10.8 -11.9 -11.8 -11.4 -11.9 -11.8 -12.1 -11.8 -11.7 -11.9 -11.6 -12.6
-11.6 -11.6 -12.0 -11.5 -11.0 -10.5 -10.2 -10.0 -9.8 -10.4 -10.0 -11.4 -12.1 -10.7 -10.5 -10.2 -10.1 -10.0 -10.6 -10.7 -12.3 -11.4 -11.0 -11.0 -10.8 -11.2 -11.2 -10.9 -11.3 -11.7 -12.0 -11.9 -11.8 -11.3 -11.1 -11.8
-8.6 -8.1 -9.2 -8.7 -8.6 -8.1 -7.7 -7.3 -6.9 -7.4 -8.3 -9.5 -9.9 -9.0 -9.1 -9.0 -8.4 -8.4 -8.5 -8.8 -10.4 -9.1 -9.2 -8.9 -8.8 -8.9 -8.1 -7.8 -8.2 -9.3 -10.1 -9.9 -10.0 -8.6 -8.0 -8.3
-4.1 -3.4 -4.6 -4.4 -4.4 -4.1 -3.9 -4.1 -3.5 -3.1 -3.3 -5.5 -5.7 -5.4 -5.2 -5.9 -5.1 -5.3 -4.6 -4.8 -5.9 -5.3 -5.3 -5.5 -5.5 -5.3 -4.6 -4.7 -4.5 -4.9 -5.4 -5.6 -5.6 -5.6 -4.2 -3.9
-1.5 -0.3 -0.7 -1.0 -1.0 -1.0 -0.9 -0.9 -0.3 0.5 0.7 -0.1 -0.1 0.1 0.4 0.1 0.1 -0.2 1.0 0.6 -0.1 0.0 -0.3 -0.5 -0.7 -0.3 0.2 0.1 0.6 0.1 -0.7 -1.5 -1.7 -2.0 -1.4 -1.1
1.3 1.7 2.3 1.5 1.3 1.3 1.7 2.0 2.2 2.6 2.9 3.2 3.8 4.3 4.8 5.0 4.7 5.4 6.1 5.3 5.2 5.0 5.1 4.6 4.0 4.5 4.3 4.1 4.0 3.5 2.9 2.2 1.8 1.2 0.9 1.4
3.8 3.8 3.8 3.5 3.4 3.5 3.8 4.3 4.6 4.8 5.1 5.9 6.2 6.7 7.2 7.3 7.6 8.2 8.2 7.6 7.4 7.5 8.0 8.3 7.3 6.7 7.4 7.6 7.3 6.5 6.4 6.4 5.4 4.5 3.8 3.7
5.0 4.9 4.9 5.3 5.9 6.1 6.5 7.0 8.0 8.1 7.9 8.7 8.3 8.4 8.4 9.0 10.3 12.4 13.7 13.8 13.4 13.8 14.3 14.2 12.2 12.3 13.9 14.3 14.3 14.0 13.5 12.8 11.5 10.2 7.3 5.6
7.7 7.3 7.1 7.3 7.8 8.4 9.4 10.6 11.0 10.5 9.9 9.8 10.0 10.3 10.7 11.4 12.0 12.7 13.2 13.7 14.1 14.6 14.8 14.8 14.7 14.7 14.7 14.6 14.3 13.8 13.1 12.4 11.6 10.5 8.8 8.1

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



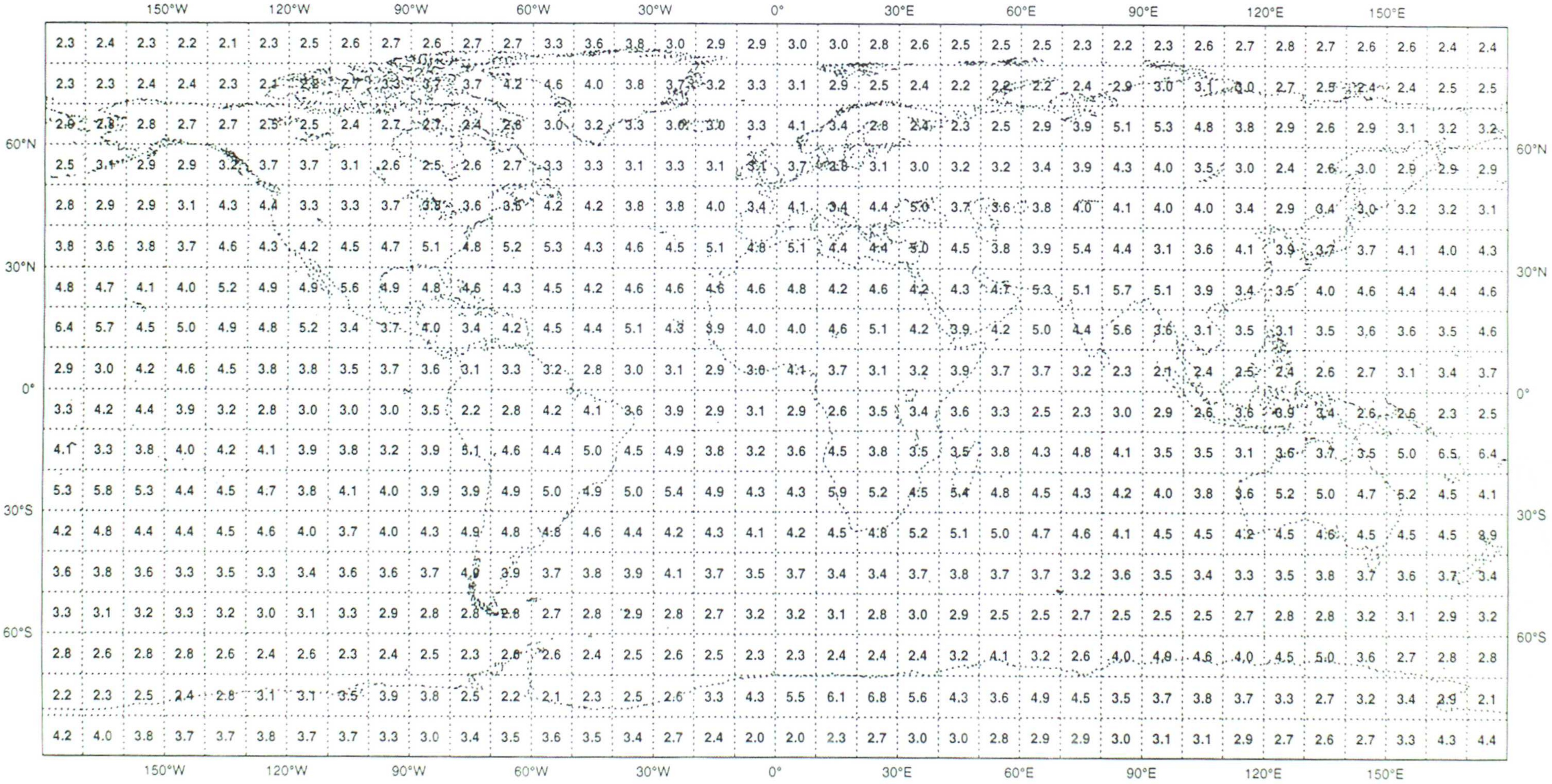
3.0	2.9	3.0	2.9	2.9	2.9	2.9	3.0	3.0	3.0	3.2	3.3	3.5	3.6	3.7	3.6	3.8	3.8	3.8	3.6	3.3	3.2	3.2	3.2	3.2	3.2	3.4	3.5	3.6	3.6	3.6	3.6	3.4	3.3	3.1	3.0
2.5	2.8	2.9	2.9	2.8	2.6	2.5	2.5	3.1	3.4	3.5	3.9	4.3	3.6	3.4	3.8	3.6	3.2	3.1	3.1	2.8	2.9	3.0	3.4	3.5	3.8	4.1	4.2	3.9	3.3	3.1	3.1	3.2	2.9	2.7	2.4
3.3	3.4	3.7	3.7	3.7	3.9	4.1	3.2	3.2	3.4	3.5	3.8	3.7	3.9	4.3	3.8	3.8	3.7	3.7	3.6	3.5	3.4	3.5	3.8	4.3	5.0	5.6	5.2	4.8	3.8	2.9	2.6	3.0	3.2	3.4	3.5
2.8	2.9	3.5	3.1	3.9	3.9	4.1	3.9	3.4	2.9	3.5	3.9	4.0	3.7	3.7	4.0	3.7	3.2	3.1	2.5	3.9	4.5	4.9	4.2	4.0	4.5	4.9	4.5	4.4	3.1	2.2	2.7	3.2	3.4	3.5	2.8
3.5	3.5	3.4	3.5	3.8	3.9	3.5	3.6	4.1	4.4	5.2	5.5	5.0	4.5	4.0	4.0	4.1	3.6	3.9	3.9	3.9	4.5	3.9	4.0	3.9	4.1	4.1	4.0	4.4	4.0	3.6	4.2	3.5	3.8	3.4	3.5
4.2	4.2	4.3	3.6	3.5	3.9	4.4	4.1	4.2	4.4	4.6	4.0	3.8	3.7	3.7	3.7	3.7	3.9	4.3	3.7	3.6	3.9	3.9	3.7	3.4	5.7	4.0	3.6	4.2	4.0	4.6	4.5	4.7	4.8	4.1	4.1
3.9	3.5	3.6	3.5	3.4	3.9	3.8	4.0	3.8	3.7	3.7	3.5	3.5	3.5	3.5	3.6	3.4	3.6	3.9	4.1	3.6	3.8	3.7	3.9	4.1	3.6	4.8	4.4	4.1	3.8	3.9	3.6	3.6	3.8	3.4	3.4
3.7	3.0	3.3	3.3	3.3	3.3	3.2	3.4	3.3	3.2	3.5	3.3	3.4	3.3	3.3	3.5	3.4	3.6	3.5	3.9	4.0	3.4	3.5	3.3	3.4	3.2	3.3	3.3	3.4	3.1	3.2	3.3	3.2	3.4	3.3	3.3
3.4	3.1	3.4	3.3	3.2	3.2	3.2	3.2	3.3	3.2	3.3	3.3	3.3	3.3	3.2	3.3	3.3	3.4	3.1	3.4	3.5	3.1	3.3	3.2	3.3	3.3	3.1	3.4	3.2	3.2	3.2	3.3	3.1	3.4	3.4	3.2
3.5	3.3	3.3	3.4	3.2	3.3	3.2	3.2	3.2	3.1	3.3	3.4	3.6	3.5	3.3	3.3	3.2	3.3	3.1	3.5	3.4	3.4	3.3	3.2	3.5	3.2	3.3	3.4	3.2	3.4	3.3	3.4	3.3	3.5	3.5	3.2
3.4	3.3	3.2	3.4	3.5	3.4	3.3	3.2	3.2	3.0	3.4	4.3	3.7	3.5	3.4	3.3	3.3	3.2	3.0	3.7	3.9	3.8	3.3	3.3	3.4	3.3	3.3	3.4	3.3	3.4	3.4	3.5	3.4	3.3	3.3	3.3
3.5	3.5	3.3	3.6	3.4	3.4	3.5	3.3	3.3	3.3	3.3	5.4	4.0	3.5	3.5	3.3	3.4	3.1	3.1	4.2	4.8	3.8	3.3	3.4	3.4	3.4	3.4	3.4	3.4	3.7	4.0	3.8	3.9	3.5	3.6	3.4
3.3	3.6	3.4	3.3	3.3	3.3	3.3	3.4	3.3	3.5	3.6	4.7	3.9	3.8	3.8	3.6	3.6	3.6	3.7	4.2	4.5	3.6	3.1	3.6	3.6	3.2	3.1	3.5	3.5	3.5	3.6	3.7	3.9	3.6	3.7	3.2
3.3	3.3	3.1	3.1	3.2	3.1	3.1	3.2	3.1	3.1	3.9	3.4	3.3	3.5	3.5	3.6	3.9	3.9	4.1	3.9	4.1	3.7	3.7	4.0	4.0	3.7	3.7	3.8	3.5	3.3	3.3	3.4	3.3	3.5	3.4	3.3
2.8	2.7	2.9	3.1	2.7	2.8	2.8	2.9	2.8	2.7	2.6	2.9	3.0	2.8	2.7	2.9	3.2	3.6	3.3	2.8	3.1	3.1	2.8	2.7	3.1	3.0	2.7	2.5	2.5	2.4	2.6	3.0	2.9	2.7	3.1	3.4
2.2	2.3	2.3	2.2	2.1	2.2	2.4	2.5	2.6	2.7	2.6	2.8	2.6	2.3	2.4	2.8	3.1	3.0	2.8	2.6	2.5	2.4	2.5	2.8	2.6	2.2	2.8	2.9	3.0	2.9	3.1	3.4	3.0	2.5	2.6	2.5
2.0	2.0	2.0	2.1	2.4	2.6	2.7	2.8	2.8	2.8	2.5	2.3	2.1	2.0	2.2	2.4	2.5	2.8	3.1	3.0	3.1	2.4	1.6	1.4	1.9	1.7	1.1	1.2	1.3	1.3	1.2	1.1	1.5	2.0	2.0	1.9
2.6	2.7	2.7	2.7	2.6	2.6	2.5	2.4	2.3	2.1	2.2	2.2	2.1	2.0	1.9	1.6	1.5	1.5	1.6	1.8	1.9	2.0	1.9	1.8	1.7	1.6	1.6	1.6	1.5	1.5	1.4	1.4	1.5	1.8	2.4	2.5

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



6.8	6.8	6.9	7.0	7.4	7.5	7.4	7.7	8.1	9.1	9.2	8.8	9.5	9.7	10.0	8.1	6.6	6.3	6.0	5.9	6.2	6.4	6.3	6.3	6.7	7.1	7.3	7.3	7.1	7.0	6.9	6.8	6.7	6.7	6.7	6.7
5.0	4.9	4.7	4.7	5.1	5.6	6.5	6.5	8.2	8.7	5.7	5.6	7.0	9.7	10.5	6.5	3.6	3.0	2.8	3.4	4.1	4.8	5.2	5.6	6.1	6.6	6.9	7.2	7.1	6.7	6.5	6.3	6.0	5.7	5.5	5.1
3.6	3.1	3.3	2.9	2.7	3.4	4.6	6.4	7.0	6.5	6.5	5.5	4.0	5.9	4.3	2.7	1.8	1.4	0.9	2.7	4.0	4.8	5.7	6.0	6.3	6.6	7.4	7.9	8.6	8.9	8.6	8.4	7.4	5.8	5.7	5.1
2.0	2.1	1.1	0.7	1.0	1.2	1.9	3.4	4.7	5.1	5.5	4.8	-2.7	1.6	0.6	0.2	0.3	0.6	0.9	0.7	1.2	3.0	3.4	3.8	4.0	3.9	4.4	5.7	6.7	8.7	8.6	7.9	4.1	2.8	3.0	2.3
-0.1	0.4	0.3	0.0	-0.9	-1.6	-0.2	0.1	0.5	1.3	1.8	1.7	0.0	-1.3	-1.2	-0.9	-1.2	-0.6	-1.4	-0.7	-0.9	-1.5	-0.5	-0.5	-1.1	-0.4	-0.6	0.4	1.9	4.2	4.7	0.5	1.7	0.8	0.0	0.1
-3.4	-3.2	-2.1	-2.3	-3.6	-3.9	-4.3	-4.2	-4.5	-3.9	-3.6	-5.0	-5.2	-3.6	-4.2	-5.1	-6.3	-4.7	-4.1	-3.0	-3.9	-6.4	-4.8	-3.0	-2.5	-0.7	0.8	-0.2	-2.4	-2.8	-2.2	-2.1	-2.1	-2.7	-3.8	-3.8
-10.9	-10.0	-8.5	-7.8	-8.5	-10.2	-11.5	-9.3	-6.7	-7.1	-7.5	-7.6	-6.6	-4.9	-6.8	-6.7	-8.6	-9.7	-10.3	-9.6	-9.6	-10.4	-7.7	-9.0	-9.8	-9.9	-9.7	-7.2	-6.6	-5.9	-5.3	-5.7	-6.4	-7.4	-8.4	-10.6
-9.5	-10.1	-11.0	-10.6	-9.3	-9.6	-7.4	-4.1	-6.2	-7.8	-9.0	-8.7	-7.5	-8.1	-7.0	-4.8	-6.4	-9.2	-10.3	-9.3	-8.2	-8.5	-11.0	-12.5	-10.8	-10.5	-7.3	-5.1	-5.7	-6.0	-5.7	-7.4	-9.1	-10.7	-12.5	-12.2
-4.4	-4.5	-5.8	-6.6	-7.6	-7.0	-6.8	-7.3	-6.3	-4.6	-3.4	-4.5	-4.5	-3.1	-2.8	-2.9	-5.1	-6.9	-5.0	-3.6	-2.6	-4.3	-7.2	-6.4	-4.5	-3.4	-3.2	-3.0	-3.4	-4.3	-4.6	-4.9	-5.3	-5.7	-6.3	-6.1
-5.3	-8.4	-11.3	-13.7	-13.7	-13.4	-13.2	-12.7	-10.3	-6.4	-2.0	-2.9	-7.1	-9.0	-9.9	-9.9	-10.0	-7.7	-4.6	-1.9	-3.5	-5.3	-5.4	-3.7	-2.1	-2.5	-3.5	-3.4	-3.9	-5.5	-6.3	-5.2	-4.0	-3.6	-3.3	-3.9
-5.2	-5.1	-7.3	-8.8	-9.7	-10.7	-12.5	-13.1	-13.1	-11.9	-8.0	-7.0	-6.6	-8.0	-8.8	-10.0	-12.2	-11.3	-9.5	-5.2	-5.8	-7.7	-8.4	-7.8	-6.6	-8.0	-10.0	-11.3	-10.3	-10.1	-8.5	-7.8	-10.6	-10.6	-7.8	-6.7
-8.5	-7.5	-6.0	-4.2	-3.7	-4.0	-4.9	-6.9	-8.5	-10.2	-12.1	-10.2	-9.1	-6.8	-6.0	-6.3	-7.3	-9.3	-10.7	-10.9	-8.2	-7.6	-7.8	-7.1	-8.2	-8.8	-9.8	-10.3	-11.3	-11.2	-7.6	-7.4	-8.1	-8.6	-9.9	-9.5
-3.9	-3.4	-4.3	-4.5	-4.0	-3.4	-2.2	-2.9	-2.9	-4.4	-5.8	-4.8	-5.1	-4.4	-4.4	-3.3	-2.9	-4.4	-5.6	-6.4	-6.0	-5.5	-5.9	-4.9	-4.9	-5.5	-5.0	-5.7	-5.8	-5.9	-6.2	-5.8	-6.2	-5.8	-4.4	-4.0
-1.1	-1.3	-1.1	-1.0	-1.5	-1.2	-0.5	-0.4	-0.9	-0.6	-0.4	-0.5	-0.7	-0.6	-0.5	-0.9	-0.3	-0.4	0.3	0.5	0.2	0.0	-0.2	-0.4	-0.6	0.0	-0.4	-0.6	-0.3	-0.2	-0.6	-1.1	-1.7	-2.2	-1.0	-0.6
-0.3	0.0	0.5	0.4	0.3	0.6	0.9	0.9	0.9	1.5	2.0	1.9	1.9	2.1	2.3	2.6	2.5	2.8	2.9	2.6	2.6	2.3	2.2	1.9	1.7	2.0	2.0	1.8	1.8	1.3	1.2	1.1	1.0	0.6	0.5	0.1
1.5	1.6	1.8	1.2	1.2	1.3	1.4	1.9	2.2	2.4	2.8	3.0	3.1	3.4	4.0	4.2	4.5	4.7	4.6	4.7	4.4	4.3	5.3	6.1	4.9	4.0	5.1	5.4	5.6	4.9	4.9	5.1	3.4	2.4	1.9	1.9
3.2	2.6	2.6	3.2	3.9	3.8	4.3	4.6	5.7	5.7	5.2	6.2	5.5	5.4	5.4	6.6	8.7	12.6	15.7	16.1	15.3	16.2	18.0	18.2	13.0	13.8	18.4	20.0	20.9	20.6	20.2	18.8	15.6	12.1	6.2	4.0
7.0	6.4	6.2	6.5	7.0	7.8	9.3	11.6	12.1	10.2	8.6	8.2	8.8	9.5	10.4	11.8	13.3	14.8	16.1	17.4	18.6	20.3	21.6	22.3	22.6	22.8	23.1	22.9	22.1	20.8	18.9	16.9	15.1	12.2	8.7	7.5

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



2.3	2.4	2.3	2.2	2.1	2.3	2.5	2.6	2.7	2.6	2.7	2.7	3.3	3.6	3.8	3.0	2.9	2.9	3.0	3.0	2.8	2.6	2.5	2.5	2.5	2.3	2.2	2.3	2.6	2.7	2.8	2.7	2.6	2.6	2.4	2.4
2.3	2.3	2.4	2.4	2.3	2.1	2.8	2.7	3.3	3.7	3.7	4.2	4.6	4.0	3.8	3.7	3.2	3.3	3.1	2.9	2.5	2.4	2.2	2.2	2.2	2.4	2.9	3.0	3.1	3.0	2.7	2.5	2.4	2.4	2.5	2.5
2.9	2.8	2.8	2.7	2.7	2.5	2.5	2.4	2.7	2.7	2.4	2.8	3.0	3.2	3.3	3.0	3.0	3.3	4.1	3.4	2.8	2.4	2.3	2.5	2.9	3.9	5.1	5.3	4.8	3.8	2.9	2.6	2.9	3.1	3.2	3.2
2.5	3.1	2.9	2.9	3.2	3.7	3.7	3.1	2.6	2.5	2.6	2.7	3.3	3.3	3.1	3.3	3.1	3.1	3.7	2.8	3.1	3.0	3.2	3.2	3.4	3.9	4.3	4.0	3.5	3.0	2.4	2.6	3.0	2.9	2.9	2.9
2.8	2.9	2.9	3.1	4.3	4.4	3.3	3.3	3.7	3.8	3.6	3.5	4.2	4.2	3.8	3.8	4.0	3.4	4.1	3.4	4.4	5.0	3.7	3.6	3.8	4.0	4.1	4.0	4.0	3.4	2.9	3.4	3.0	3.2	3.2	3.1
3.8	3.6	3.8	3.7	4.6	4.3	4.2	4.5	4.7	5.1	4.8	5.2	5.3	4.3	4.6	4.5	5.1	4.8	5.1	4.4	4.4	5.0	4.5	3.8	3.9	5.4	4.4	3.1	3.6	4.1	3.9	3.7	3.7	4.1	4.0	4.3
4.8	4.7	4.1	4.0	5.2	4.9	4.9	5.6	4.9	4.8	4.6	4.3	4.5	4.2	4.6	4.6	4.6	4.6	4.8	4.2	4.6	4.2	4.3	4.7	5.3	5.1	5.7	5.1	3.9	3.4	3.5	4.0	4.6	4.4	4.4	4.6
6.4	5.7	4.5	5.0	4.9	4.8	5.2	3.4	3.7	4.0	3.4	4.2	4.5	4.4	5.1	4.3	3.9	4.0	4.0	4.6	5.1	4.2	3.9	4.2	5.0	4.4	5.6	3.6	3.1	3.5	3.1	3.5	3.6	3.6	3.5	4.6
2.9	3.0	4.2	4.6	4.5	3.8	3.8	3.5	3.7	3.6	3.1	3.3	3.2	2.8	3.0	3.1	2.9	3.0	4.1	3.7	3.1	3.2	3.9	3.7	3.7	3.2	2.3	2.1	2.4	2.5	2.4	2.6	2.7	3.1	3.4	3.7
3.3	4.2	4.4	3.9	3.2	2.8	3.0	3.0	3.0	3.5	2.2	2.8	4.2	4.1	3.6	3.9	2.9	3.1	2.9	2.6	3.5	3.4	3.6	3.3	2.5	2.3	3.0	2.9	2.6	3.6	3.9	3.4	2.6	2.6	2.3	2.5
4.1	3.3	3.8	4.0	4.2	4.1	3.9	3.8	3.2	3.9	5.1	4.6	4.4	5.0	4.5	4.9	3.8	3.2	3.6	4.5	3.8	3.5	3.5	3.8	4.3	4.8	4.1	3.5	3.5	3.1	3.6	3.7	3.5	5.0	6.5	6.4
5.3	5.8	5.3	4.4	4.5	4.7	3.8	4.1	4.0	3.9	3.9	4.9	5.0	4.9	5.0	5.4	4.9	4.3	4.3	5.9	5.2	4.5	5.4	4.8	4.5	4.3	4.2	4.0	3.8	3.6	5.2	5.0	4.7	5.2	4.5	4.1
4.2	4.8	4.4	4.4	4.5	4.6	4.0	3.7	4.0	4.3	4.9	4.8	4.8	4.6	4.4	4.2	4.3	4.1	4.2	4.5	4.8	5.2	5.1	5.0	4.7	4.6	4.1	4.5	4.5	4.2	4.5	4.6	4.5	4.5	4.5	3.9
3.6	3.8	3.6	3.3	3.5	3.3	3.4	3.6	3.6	3.7	4.0	3.9	3.7	3.8	3.9	4.1	3.7	3.5	3.7	3.4	3.4	3.7	3.8	3.7	3.7	3.2	3.6	3.5	3.4	3.3	3.5	3.8	3.7	3.6	3.7	3.4
3.3	3.1	3.2	3.3	3.2	3.0	3.1	3.3	2.9	2.8	2.8	2.8	2.7	2.8	2.9	2.8	2.7	3.2	3.2	3.1	2.8	3.0	2.9	2.5	2.5	2.7	2.5	2.5	2.5	2.7	2.8	2.8	3.2	3.1	2.9	3.2
2.8	2.6	2.8	2.8	2.6	2.4	2.6	2.3	2.4	2.5	2.3	2.6	2.6	2.4	2.5	2.6	2.5	2.3	2.3	2.4	2.4	2.4	3.2	4.1	3.2	2.6	4.0	4.9	4.6	4.0	4.5	5.0	3.6	2.7	2.8	2.8
2.2	2.3	2.5	2.4	2.8	3.1	3.1	3.5	3.9	3.8	2.5	2.2	2.1	2.3	2.5	2.6	3.3	4.3	5.5	6.1	6.8	5.6	4.3	3.6	4.9	4.5	3.5	3.7	3.8	3.7	3.3	2.7	3.2	3.4	2.9	2.1
4.2	4.0	3.8	3.7	3.7	3.8	3.7	3.7	3.3	3.0	3.4	3.5	3.6	3.5	3.4	2.7	2.4	2.0	2.0	2.3	2.7	3.0	3.0	2.8	2.9	2.9	3.0	3.1	3.1	2.9	2.7	2.6	2.7	3.3	4.3	4.4

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: HIRS4 (400 hPa)
NOAA15, using all observations

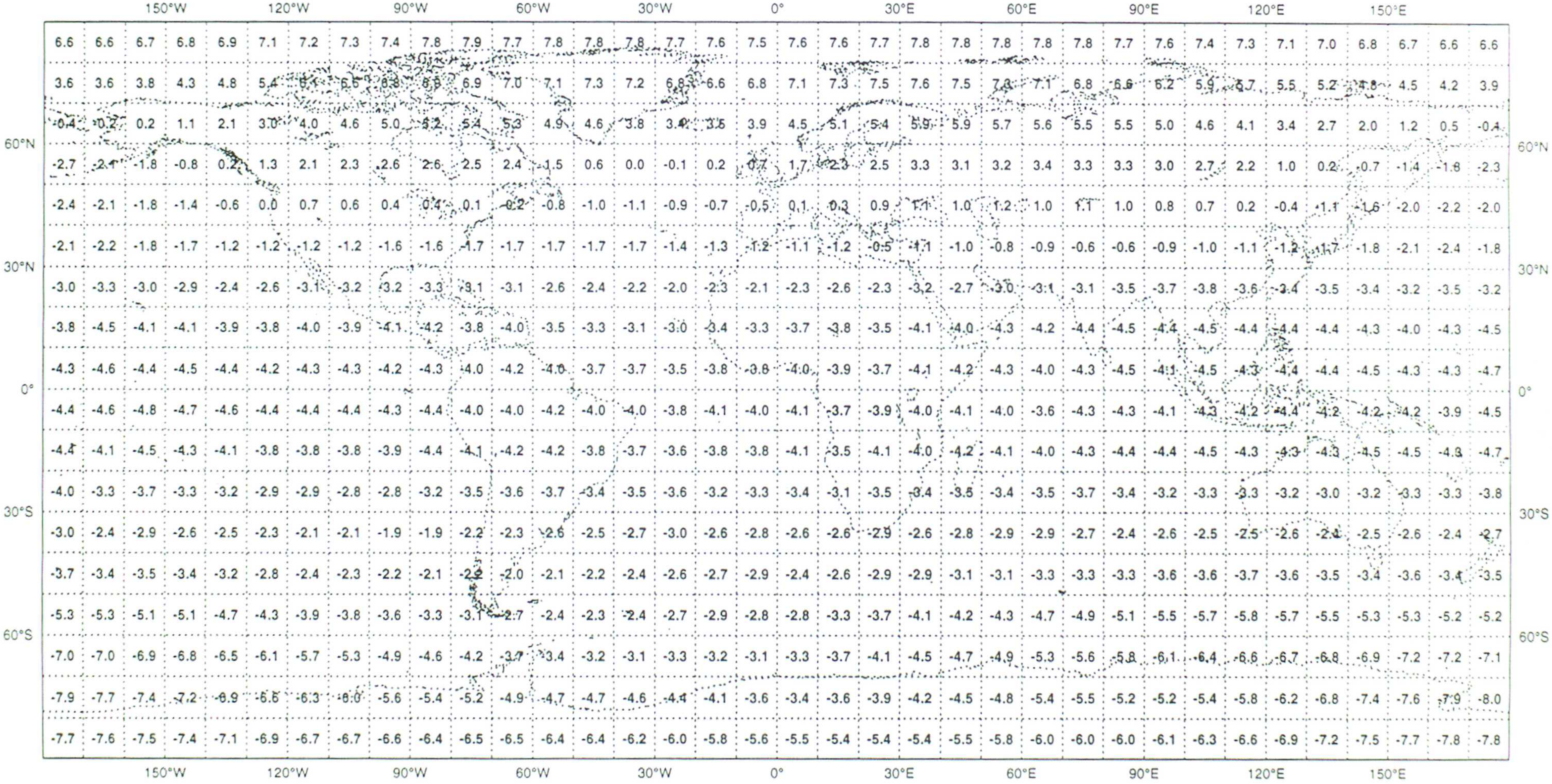
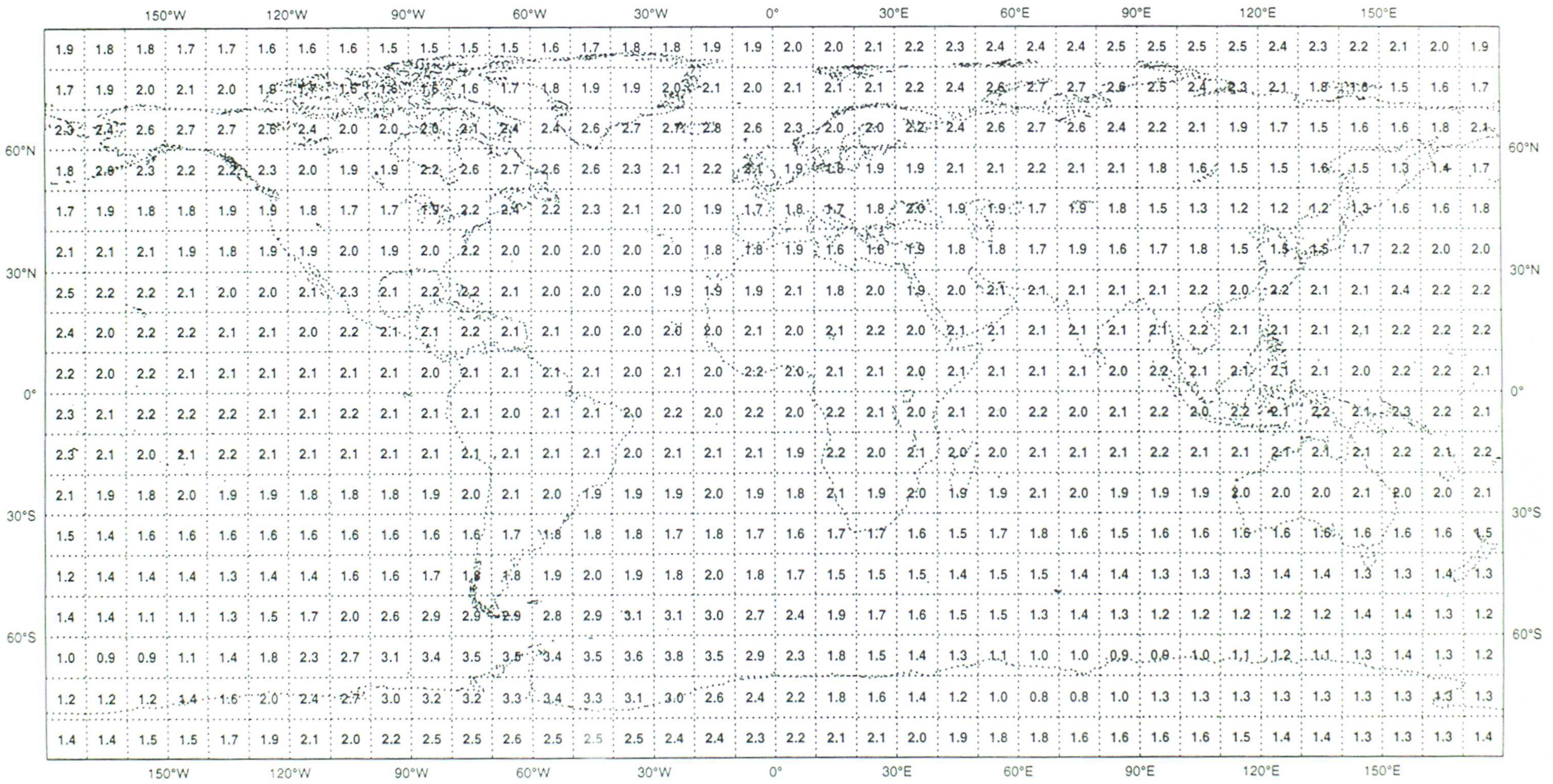

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
6.6 6.6 6.7 6.8 6.9 7.1 7.2 7.3 7.4 7.8 7.9 7.7 7.8 7.8 7.8 7.7 7.6 7.5 7.6 7.6 7.7 7.8 7.8 7.8 7.8 7.8 7.7 7.6 7.4 7.3 7.1 7.0 6.8 6.7 6.6 6.6
3.6 3.6 3.8 4.3 4.8 5.4 6.1 6.5 6.8 6.9 6.9 7.0 7.1 7.3 7.2 6.8 6.6 6.8 7.1 7.3 7.5 7.6 7.5 7.3 7.1 6.8 6.6 6.2 5.9 5.7 5.5 5.2 4.8 4.5 4.2 3.9
-0.4 0.2 0.2 1.1 2.1 3.0 4.0 4.6 5.0 5.2 5.4 5.3 4.9 4.6 3.8 3.4 3.5 3.9 4.5 5.1 5.4 5.9 5.9 5.7 5.6 5.5 5.5 5.0 4.6 4.1 3.4 2.7 2.0 1.2 0.5 -0.4
-2.7 -2.4 -1.8 -0.8 0.2 1.3 2.1 2.3 2.6 2.6 2.5 2.4 1.5 0.6 0.0 -0.1 0.2 0.7 1.7 2.3 2.5 3.3 3.1 3.2 3.4 3.3 3.3 3.0 2.7 2.2 1.0 0.2 -0.7 -1.4 -1.8 -2.3
-2.4 -2.1 -1.8 -1.4 -0.6 0.0 0.7 0.6 0.4 0.4 0.1 -0.2 -0.8 -1.0 -1.1 -0.9 -0.7 -0.5 0.1 0.3 0.9 1.1 1.0 1.2 1.0 1.1 1.0 0.8 0.7 0.2 -0.4 -1.1 -1.6 -2.0 -2.2 -2.0
-2.1 -2.2 -1.8 -1.7 -1.2 -1.2 -1.2 -1.2 -1.6 -1.6 -1.7 -1.7 -1.7 -1.7 -1.7 -1.4 -1.3 -1.2 -1.1 -1.2 -0.5 -1.1 -1.0 -0.8 -0.9 -0.6 -0.6 -0.9 -1.0 -1.1 -1.2 -1.7 -1.8 -2.1 -2.4 -1.8
-3.0 -3.3 -3.0 -2.9 -2.4 -2.6 -3.1 -3.2 -3.2 -3.3 -3.1 -3.1 -2.6 -2.4 -2.2 -2.0 -2.3 -2.1 -2.3 -2.6 -2.3 -3.2 -2.7 -3.0 -3.1 -3.1 -3.5 -3.7 -3.8 -3.6 -3.4 -3.5 -3.4 -3.2 -3.5 -3.2
-3.8 -4.5 -4.1 -4.1 -3.9 -3.8 -4.0 -3.9 -4.1 -4.2 -3.8 -4.0 -3.5 -3.3 -3.1 -3.0 -3.4 -3.3 -3.7 -3.8 -3.5 -4.1 -4.0 -4.3 -4.2 -4.4 -4.5 -4.4 -4.5 -4.4 -4.4 -4.4 -4.3 -4.0 -4.3 -4.5
-4.3 -4.6 -4.4 -4.5 -4.4 -4.2 -4.3 -4.3 -4.2 -4.3 -4.0 -4.2 -4.0 -3.7 -3.7 -3.5 -3.8 -3.8 -4.0 -3.9 -3.7 -4.1 -4.2 -4.3 -4.0 -4.3 -4.5 -4.1 -4.5 -4.3 -4.4 -4.4 -4.5 -4.3 -4.3 -4.7
-4.4 -4.6 -4.8 -4.7 -4.6 -4.4 -4.4 -4.4 -4.3 -4.4 -4.0 -4.0 -4.2 -4.0 -4.0 -3.8 -4.1 -4.0 -4.1 -3.7 -3.9 -4.0 -4.1 -4.0 -3.6 -4.3 -4.3 -4.1 -4.3 -4.2 -4.4 -4.2 -4.2 -4.2 -3.9 -4.5
-4.4 -4.1 -4.5 -4.3 -4.1 -3.8 -3.8 -3.8 -3.9 -4.4 -4.1 -4.2 -4.2 -3.8 -3.7 -3.6 -3.8 -3.8 -4.1 -3.5 -4.1 -4.0 -4.2 -4.1 -4.0 -4.3 -4.4 -4.4 -4.5 -4.3 -4.3 -4.3 -4.5 -4.5 -4.3 -4.7
-4.0 -3.3 -3.7 -3.3 -3.2 -2.9 -2.9 -2.8 -2.8 -3.2 -3.5 -3.6 -3.7 -3.4 -3.5 -3.6 -3.2 -3.3 -3.4 -3.1 -3.5 -3.4 -3.5 -3.4 -3.5 -3.7 -3.4 -3.2 -3.3 -3.3 -3.2 -3.0 -3.2 -3.3 -3.3 -3.8
-3.0 -2.4 -2.9 -2.6 -2.5 -2.3 -2.1 -2.1 -1.9 -1.9 -2.2 -2.3 -2.6 -2.5 -2.7 -3.0 -2.6 -2.8 -2.6 -2.6 -2.9 -2.6 -2.8 -2.9 -2.9 -2.7 -2.4 -2.6 -2.5 -2.5 -2.6 -2.4 -2.5 -2.6 -2.4 -2.7
-3.7 -3.4 -3.5 -3.4 -3.2 -2.8 -2.4 -2.3 -2.2 -2.1 -2.2 -2.0 -2.1 -2.2 -2.4 -2.6 -2.7 -2.9 -2.4 -2.6 -2.9 -2.9 -3.1 -3.1 -3.3 -3.3 -3.3 -3.6 -3.6 -3.7 -3.6 -3.5 -3.4 -3.6 -3.4 -3.5
-5.3 -5.3 -5.1 -5.1 -4.7 -4.3 -3.9 -3.8 -3.6 -3.3 -3.1 -2.7 -2.4 -2.3 -2.4 -2.7 -2.9 -2.8 -2.8 -3.3 -3.7 -4.1 -4.2 -4.3 -4.7 -4.9 -5.1 -5.5 -5.7 -5.8 -5.7 -5.5 -5.3 -5.3 -5.2 -5.2
-7.0 -7.0 -6.9 -6.8 -6.5 -6.1 -5.7 -5.3 -4.9 -4.6 -4.2 -3.7 -3.4 -3.2 -3.1 -3.3 -3.2 -3.1 -3.3 -3.7 -4.1 -4.5 -4.7 -4.9 -5.3 -5.6 -5.8 -6.1 -6.4 -6.6 -6.7 -6.8 -6.9 -7.2 -7.2 -7.1
-7.9 -7.7 -7.4 -7.2 -6.9 -6.6 -6.3 -6.0 -5.6 -5.4 -5.2 -4.9 -4.7 -4.7 -4.6 -4.4 -4.1 -3.6 -3.4 -3.6 -3.9 -4.2 -4.5 -4.8 -5.4 -5.5 -5.2 -5.2 -5.4 -5.8 -6.2 -6.8 -7.4 -7.6 -7.9 -8.0
-7.7 -7.6 -7.5 -7.4 -7.1 -6.9 -6.7 -6.7 -6.6 -6.4 -6.5 -6.5 -6.4 -6.4 -6.2 -6.0 -5.8 -5.6 -5.5 -5.4 -5.4 -5.4 -5.5 -5.8 -6.0 -6.0 -6.0 -6.1 -6.3 -6.6 -6.9 -7.2 -7.5 -7.7 -7.8 -7.8
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



1.9	1.8	1.8	1.7	1.7	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.6	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.2	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.4	2.3	2.2	2.1	2.0	1.9
1.7	1.9	2.0	2.1	2.0	1.8	1.7	1.6	1.8	1.5	1.6	1.7	1.8	1.9	1.9	2.0	2.1	2.0	2.1	2.1	2.1	2.2	2.4	2.6	2.7	2.7	2.6	2.5	2.4	2.3	2.1	1.8	1.8	1.5	1.6	1.7
2.3	2.4	2.6	2.7	2.7	2.6	2.4	2.0	2.0	2.0	2.1	2.4	2.4	2.6	2.7	2.7	2.8	2.6	2.3	2.0	2.0	2.2	2.4	2.6	2.7	2.6	2.4	2.2	2.1	1.9	1.7	1.5	1.6	1.6	1.8	2.1
1.8	2.8	2.3	2.2	2.2	2.3	2.0	1.9	1.9	2.2	2.6	2.7	2.6	2.6	2.3	2.1	2.2	2.1	1.9	1.8	1.9	1.9	2.1	2.1	2.2	2.1	2.1	1.8	1.6	1.5	1.5	1.6	1.5	1.3	1.4	1.7
1.7	1.9	1.8	1.8	1.9	1.9	1.8	1.7	1.7	1.9	2.2	2.4	2.2	2.3	2.1	2.0	1.9	1.7	1.8	1.7	1.8	2.0	1.9	1.9	1.7	1.9	1.8	1.5	1.3	1.2	1.2	1.2	1.3	1.6	1.6	1.8
2.1	2.1	2.1	1.9	1.8	1.9	1.9	2.0	1.9	2.0	2.2	2.0	2.0	2.0	2.0	2.0	1.8	1.8	1.9	1.6	1.8	1.9	1.8	1.8	1.7	1.9	1.6	1.7	1.8	1.5	1.5	1.5	1.7	2.2	2.0	2.0
2.5	2.2	2.2	2.1	2.0	2.0	2.1	2.3	2.1	2.2	2.2	2.1	2.0	2.0	2.0	1.9	1.9	1.9	2.1	1.8	2.0	1.9	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.0	2.2	2.1	2.1	2.4	2.2	2.2
2.4	2.0	2.2	2.2	2.1	2.1	2.0	2.2	2.1	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.2	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.2	2.2
2.2	2.0	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.2	2.0	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.2	2.1	2.1	2.1	2.1	2.0	2.2	2.2	2.1
2.3	2.1	2.2	2.2	2.2	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.1	2.1	2.0	2.2	2.0	2.2	2.0	2.2	2.1	2.0	2.1	2.0	2.2	2.0	2.1	2.2	2.0	2.2	2.1	2.2	2.1	2.3	2.2	2.1
2.3	2.1	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	1.9	2.2	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2
2.1	1.9	1.8	2.0	1.9	1.9	1.8	1.8	1.8	1.9	2.0	2.1	2.0	1.9	1.9	1.9	2.0	1.9	1.8	2.1	1.9	2.0	1.9	1.9	2.1	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.1	2.0	2.0	2.1
1.5	1.4	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.8	1.8	1.8	1.7	1.8	1.7	1.6	1.7	1.7	1.6	1.5	1.7	1.8	1.6	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5
1.2	1.4	1.4	1.4	1.3	1.4	1.4	1.6	1.6	1.7	1.8	1.8	1.9	2.0	1.9	1.8	2.0	1.8	1.7	1.5	1.5	1.5	1.4	1.5	1.5	1.4	1.4	1.3	1.3	1.3	1.4	1.4	1.3	1.3	1.4	1.3
1.4	1.4	1.1	1.1	1.3	1.5	1.7	2.0	2.6	2.9	2.9	2.9	2.8	2.9	3.1	3.1	3.0	2.7	2.4	1.9	1.7	1.6	1.5	1.5	1.3	1.4	1.3	1.2	1.2	1.2	1.2	1.2	1.4	1.4	1.3	1.2
1.0	0.9	0.9	1.1	1.4	1.8	2.3	2.7	3.1	3.4	3.5	3.5	3.4	3.5	3.6	3.8	3.5	2.9	2.3	1.8	1.5	1.4	1.3	1.1	1.0	1.0	0.9	0.8	1.0	1.1	1.2	1.1	1.3	1.4	1.3	1.2
1.2	1.2	1.2	1.4	1.6	2.0	2.4	2.7	3.0	3.2	3.2	3.3	3.4	3.3	3.1	3.0	2.6	2.4	2.2	1.8	1.6	1.4	1.2	1.0	0.8	0.8	1.0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
1.4	1.4	1.5	1.5	1.7	1.9	2.1	2.0	2.2	2.5	2.5	2.6	2.5	2.5	2.5	2.4	2.4	2.3	2.2	2.1	2.1	2.0	1.9	1.8	1.8	1.6	1.6	1.6	1.6	1.5	1.4	1.4	1.3	1.3	1.3	1.4

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

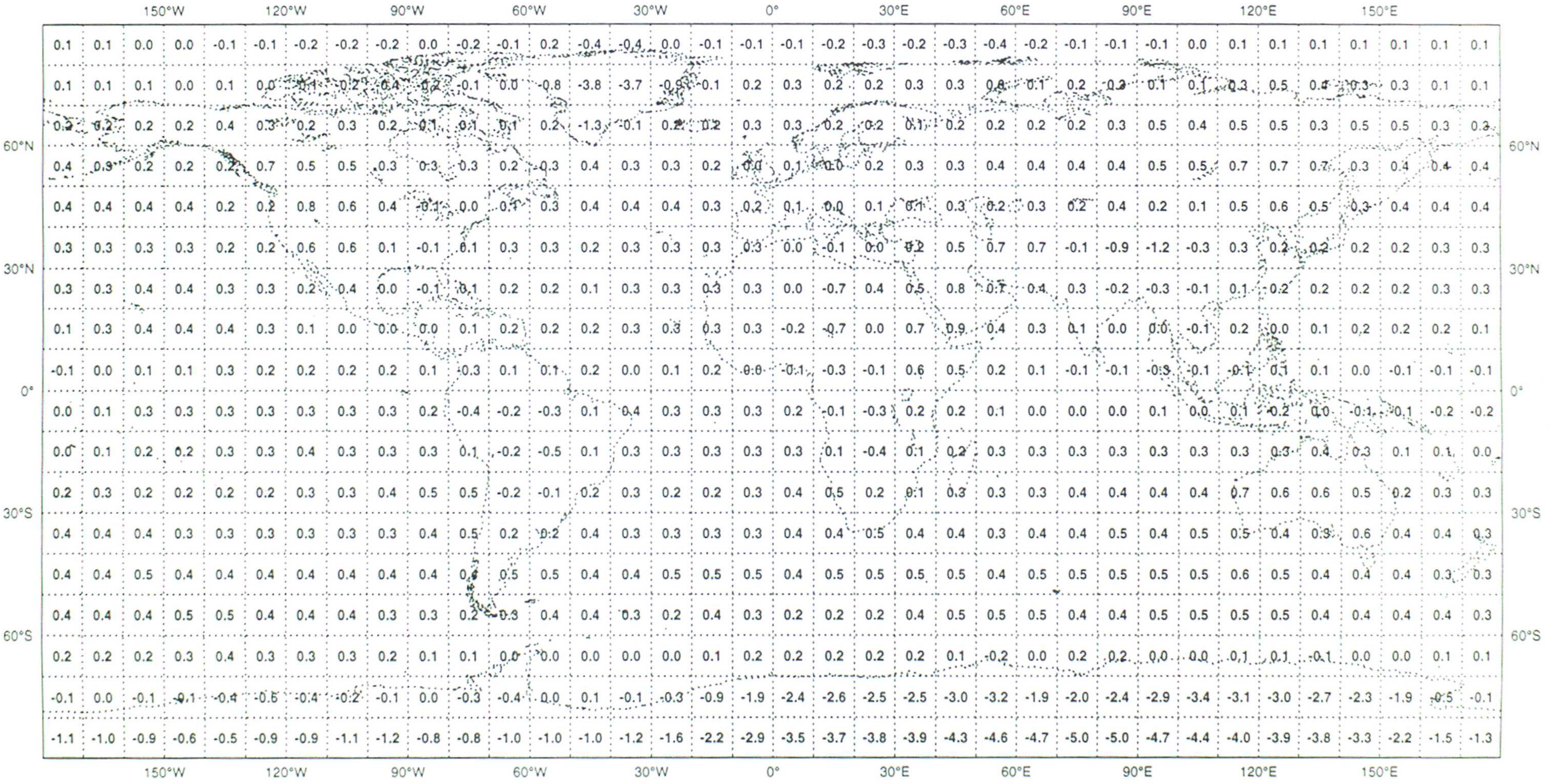

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0.1 0.1 0.0 0.0 -0.1 -0.1 -0.2 -0.2 -0.2 0.0 -0.2 -0.1 0.2 -0.4 -0.4 0.0 -0.1 -0.1 -0.1 -0.2 -0.3 -0.2 -0.3 -0.4 -0.2 -0.1 -0.1 -0.1 0.0 0.1 0.1 0.1 0.1 0.1 0.1 0.1
0.1 0.1 0.1 0.0 0.1 0.0 -0.1 -0.2 -0.4 -0.2 -0.1 0.0 -0.8 -3.8 -3.7 -0.9 -0.1 0.2 0.3 0.2 0.2 0.3 0.3 0.8 0.1 0.2 0.3 0.1 0.1 0.3 0.5 0.4 0.3 0.3 0.1 0.1
0.2 0.2 0.2 0.2 0.4 0.3 0.2 0.3 0.2 0.1 0.1 0.1 0.2 -1.3 -0.1 0.2 0.2 0.3 0.3 0.2 0.2 0.1 0.2 0.2 0.2 0.2 0.3 0.5 0.4 0.5 0.5 0.3 0.5 0.5 0.3 0.3
0.4 0.3 0.2 0.2 0.2 0.7 0.5 0.5 0.3 0.3 0.3 0.2 -0.3 0.4 0.3 0.3 0.2 0.0 0.1 0.0 0.2 0.3 0.3 0.4 0.4 0.4 0.4 0.5 0.5 0.7 0.7 0.7 0.3 0.4 0.4 0.4
0.4 0.4 0.4 0.4 0.2 0.2 0.8 0.6 0.4 -0.1 0.0 0.1 0.3 0.4 0.4 0.4 0.3 0.2 0.1 0.0 0.1 0.1 0.3 0.2 0.3 0.2 0.4 0.2 0.1 0.5 0.6 0.5 0.3 0.4 0.4 0.4
0.3 0.3 0.3 0.3 0.2 0.2 0.6 0.6 0.1 -0.1 0.1 0.3 0.3 0.2 0.3 0.3 0.3 0.3 0.0 -0.1 0.0 0.2 0.5 0.7 0.7 -0.1 -0.9 -1.2 -0.3 0.3 0.2 0.2 0.2 0.2 0.3 0.3
0.3 0.3 0.4 0.4 0.3 0.3 0.2 0.4 0.0 -0.1 0.1 0.2 0.2 0.1 0.3 0.3 0.3 0.3 0.0 -0.7 0.4 0.5 0.8 0.7 0.4 0.3 -0.2 -0.3 -0.1 0.1 -0.2 0.2 0.2 0.2 0.3 0.3
0.1 0.3 0.4 0.4 0.4 0.3 0.1 0.0 0.0 0.0 0.1 0.2 0.2 0.2 0.3 0.3 0.3 0.3 -0.2 -0.7 0.0 0.7 0.9 0.4 0.3 0.1 0.0 0.0 -0.1 0.2 0.0 0.1 0.2 0.2 0.2 0.1
-0.1 0.0 0.1 0.1 0.3 0.2 0.2 0.2 0.2 0.1 -0.3 0.1 0.1 0.2 0.0 0.1 0.2 0.0 -0.1 -0.3 -0.1 0.6 0.5 0.2 0.1 -0.1 -0.1 -0.3 -0.1 -0.1 0.1 0.1 0.0 -0.1 -0.1 -0.1
0.0 0.1 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.2 -0.4 -0.2 -0.3 0.1 0.4 0.3 0.3 0.3 0.2 -0.1 -0.3 0.2 0.2 0.1 0.0 0.0 0.0 0.1 0.0 0.1 -0.2 0.0 -0.1 -0.1 -0.2 -0.2
0.0 0.1 0.2 0.2 0.3 0.3 0.4 0.3 0.3 0.3 0.1 -0.2 -0.5 0.1 0.3 0.3 0.3 0.3 0.3 0.1 -0.4 0.1 0.2 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.3 0.1 0.1 0.0
0.2 0.3 0.2 0.2 0.2 0.2 0.3 0.3 0.4 0.5 0.5 -0.2 -0.1 0.2 0.3 0.2 0.2 0.3 0.4 0.5 0.2 0.1 0.3 0.3 0.3 0.4 0.4 0.4 0.4 0.7 0.6 0.6 0.5 0.2 0.3 0.3
0.4 0.4 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.5 0.2 0.2 0.4 0.3 0.3 0.3 0.3 0.4 0.4 0.5 0.4 0.4 0.3 0.4 0.4 0.5 0.4 0.5 0.5 0.4 0.3 0.6 0.4 0.4 0.3
0.4 0.4 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.5 0.4 0.4 0.5 0.5 0.5 0.4 0.5 0.5 0.5 0.5 0.4 0.5 0.5 0.5 0.5 0.5 0.6 0.5 0.4 0.4 0.4 0.3 0.3
0.4 0.4 0.4 0.5 0.5 0.4 0.4 0.4 0.3 0.3 0.2 0.3 0.4 0.4 0.3 0.2 0.4 0.3 0.2 0.2 0.2 0.4 0.5 0.5 0.5 0.4 0.4 0.5 0.5 0.5 0.5 0.4 0.4 0.4 0.4 0.3
0.2 0.2 0.2 0.3 0.4 0.3 0.3 0.3 0.2 0.1 0.1 0.0 0.0 0.0 0.0 0.0 0.1 0.2 0.2 0.2 0.2 0.2 0.1 -0.2 0.0 0.2 0.2 0.0 0.0 0.1 0.1 -0.1 0.0 0.0 0.1 0.1
-0.1 0.0 -0.1 -0.1 -0.4 -0.5 -0.4 -0.2 -0.1 0.0 -0.3 -0.4 0.0 0.1 -0.1 -0.3 -0.9 -1.9 -2.4 -2.6 -2.5 -2.5 -3.0 -3.2 -1.9 -2.0 -2.4 -2.9 -3.4 -3.1 -3.0 -2.7 -2.3 -1.9 -0.5 -0.1
-1.1 -1.0 -0.9 -0.6 -0.5 -0.9 -0.9 -1.1 -1.2 -0.8 -0.8 -1.0 -1.0 -1.0 -1.2 -1.6 -2.2 -2.9 -3.5 -3.7 -3.8 -3.9 -4.3 -4.6 -4.7 -5.0 -5.0 -4.7 -4.4 -4.0 -3.9 -3.8 -3.3 -2.2 -1.5 -1.3

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

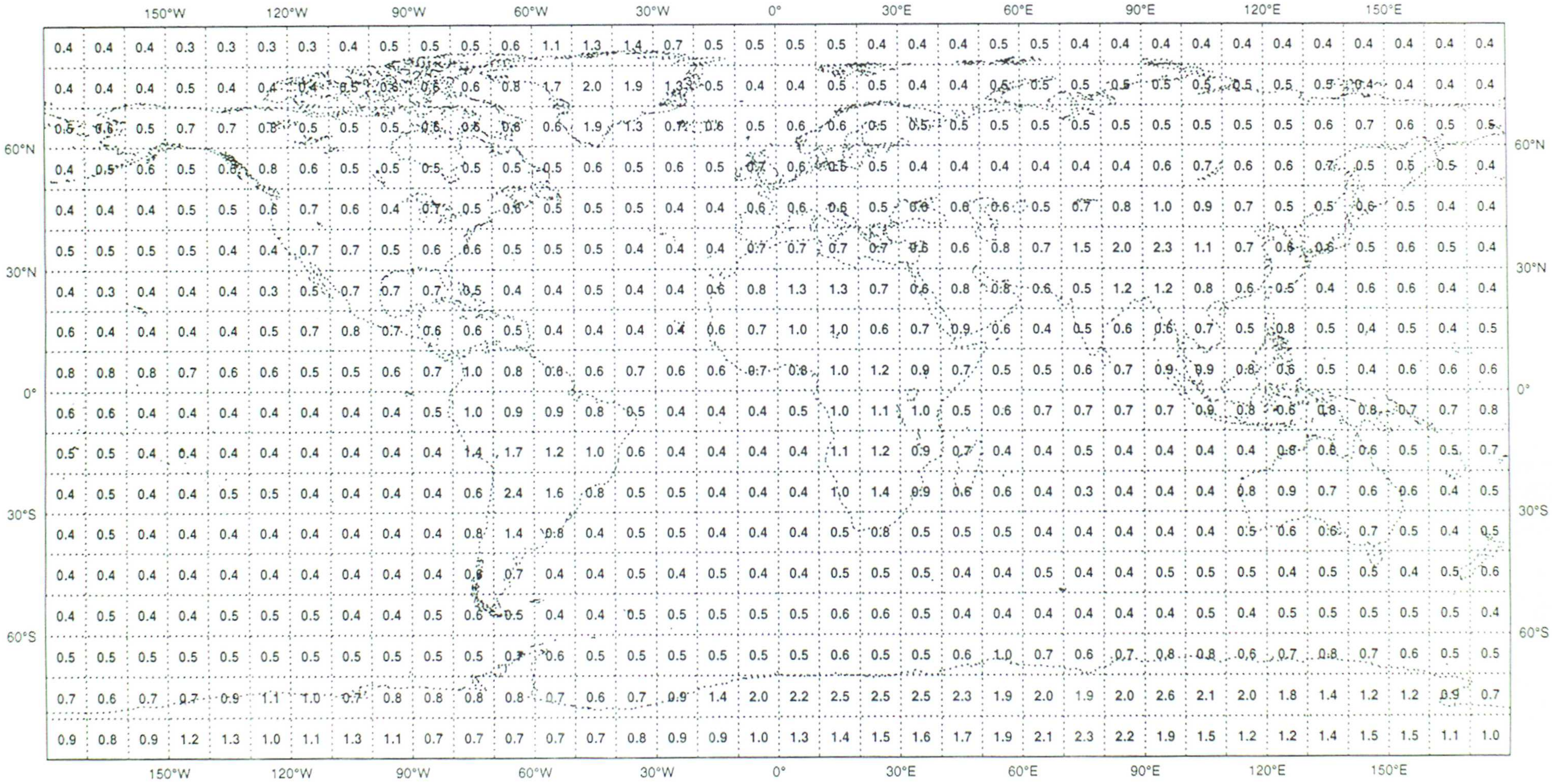
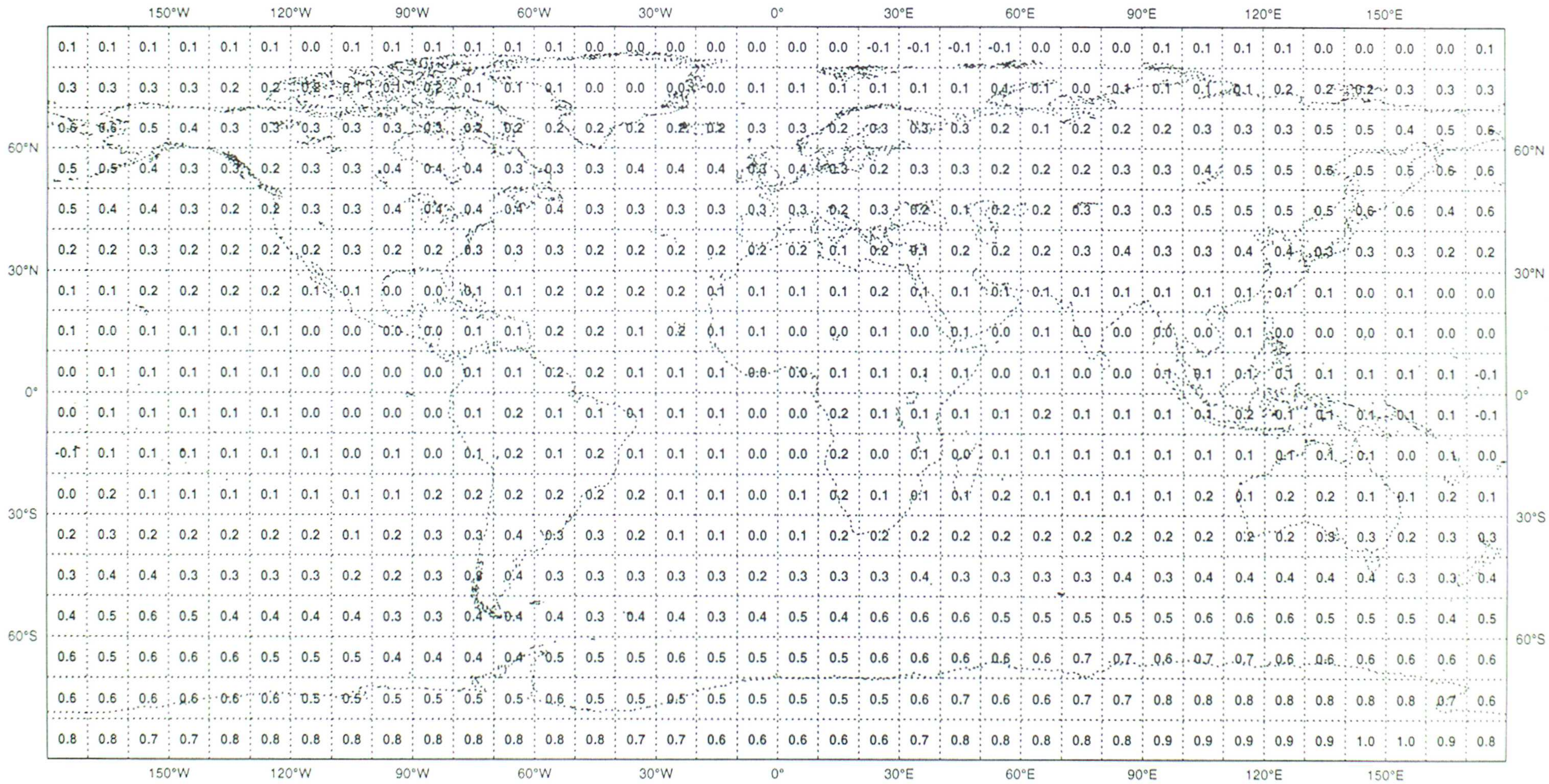
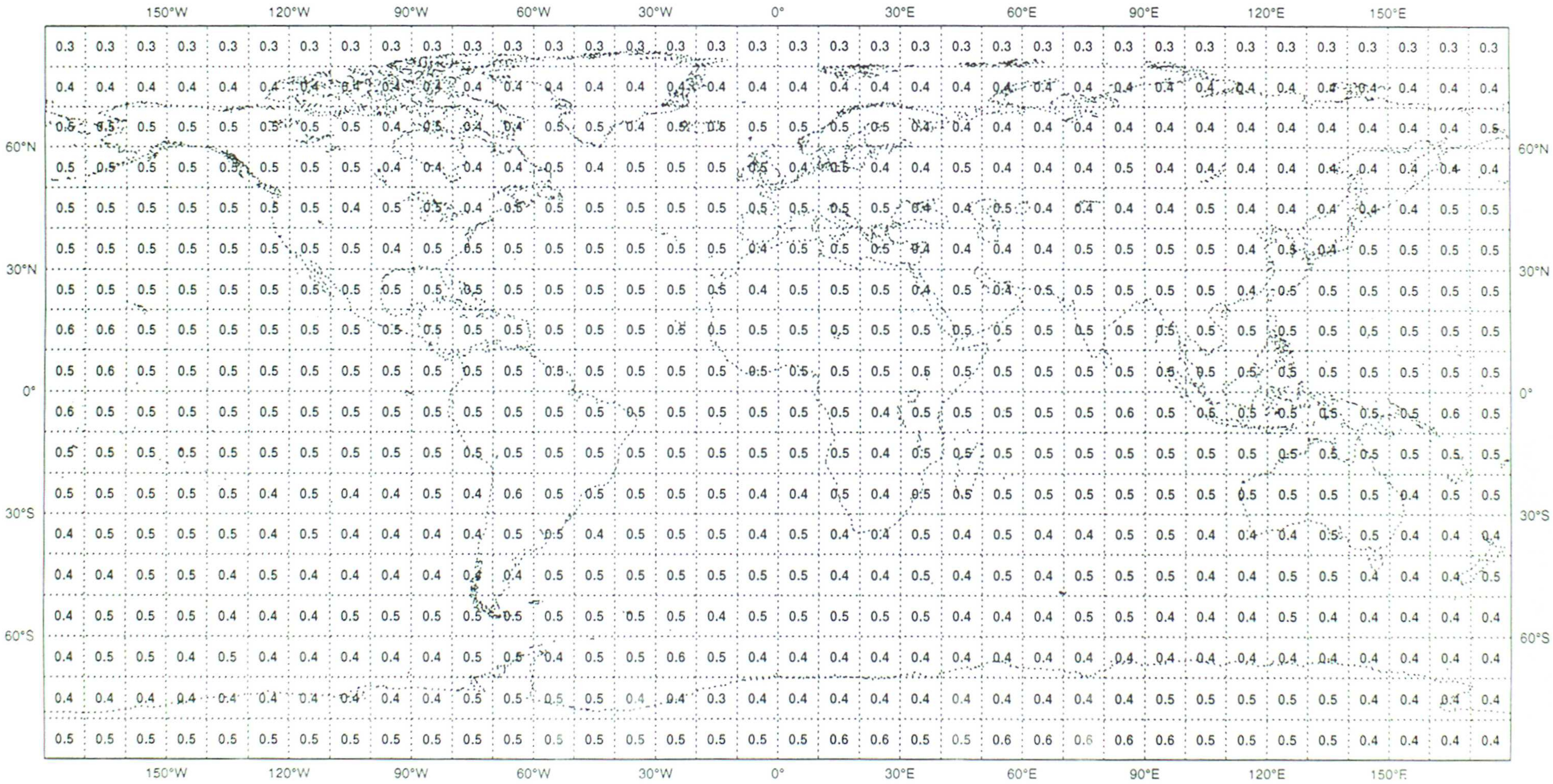

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
0.4 0.4 0.4 0.3 0.3 0.3 0.3 0.4 0.5 0.5 0.5 0.6 1.1 1.3 1.4 0.7 0.5 0.5 0.5 0.5 0.4 0.4 0.4 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4
0.4 0.4 0.4 0.5 0.4 0.4 0.4 0.5 0.8 0.5 0.6 0.8 1.7 2.0 1.9 1.3 0.5 0.4 0.4 0.5 0.5 0.4 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.4 0.4 0.4
0.5 0.6 0.5 0.7 0.7 0.8 0.5 0.5 0.5 0.6 0.6 0.6 0.6 1.9 1.3 0.7 0.6 0.5 0.6 0.6 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.6 0.7 0.6 0.5 0.5
0.4 0.5 0.6 0.5 0.8 0.8 0.6 0.5 0.5 0.5 0.5 0.5 0.5 0.6 0.5 0.6 0.5 0.7 0.6 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.6 0.7 0.6 0.6 0.7 0.5 0.5 0.5 0.4
0.4 0.4 0.4 0.5 0.5 0.6 0.7 0.6 0.4 0.7 0.5 0.6 0.5 0.5 0.5 0.4 0.4 0.6 0.6 0.6 0.5 0.6 0.6 0.6 0.5 0.7 0.8 1.0 0.9 0.7 0.5 0.5 0.6 0.5 0.4 0.4
0.5 0.5 0.5 0.5 0.4 0.4 0.7 0.7 0.5 0.6 0.6 0.5 0.5 0.5 0.4 0.4 0.4 0.7 0.7 0.7 0.7 0.6 0.6 0.8 0.7 1.5 2.0 2.3 1.1 0.7 0.6 0.6 0.5 0.6 0.5 0.4
0.4 0.3 0.4 0.4 0.4 0.3 0.5 0.7 0.7 0.7 0.5 0.4 0.4 0.5 0.4 0.4 0.6 0.8 1.3 1.3 0.7 0.6 0.8 0.8 0.6 0.5 1.2 1.2 0.8 0.6 0.5 0.4 0.6 0.6 0.4 0.4
0.6 0.4 0.4 0.4 0.4 0.5 0.7 0.8 0.7 0.6 0.6 0.5 0.4 0.4 0.4 0.4 0.6 0.7 1.0 1.0 0.6 0.7 0.9 0.6 0.4 0.5 0.6 0.6 0.7 0.5 0.8 0.5 0.4 0.5 0.4 0.5
0.8 0.8 0.8 0.7 0.6 0.6 0.5 0.5 0.6 0.7 1.0 0.8 0.8 0.6 0.7 0.6 0.6 0.7 0.8 1.0 1.2 0.9 0.7 0.5 0.5 0.6 0.7 0.9 0.9 0.8 0.6 0.5 0.4 0.6 0.6 0.6
0.6 0.6 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.5 1.0 0.9 0.9 0.8 0.5 0.4 0.4 0.4 0.5 1.0 1.1 1.0 0.5 0.6 0.7 0.7 0.7 0.7 0.9 0.8 0.6 0.8 0.8 0.7 0.7 0.8
0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 1.4 1.7 1.2 1.0 0.6 0.4 0.4 0.4 0.4 1.1 1.2 0.9 0.7 0.4 0.4 0.5 0.4 0.4 0.4 0.4 0.8 0.8 0.6 0.5 0.5 0.7
0.4 0.5 0.4 0.4 0.5 0.5 0.4 0.4 0.4 0.4 0.6 2.4 1.6 0.8 0.5 0.5 0.4 0.4 0.4 1.0 1.4 0.9 0.6 0.6 0.4 0.3 0.4 0.4 0.4 0.8 0.9 0.7 0.6 0.6 0.4 0.5
0.4 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.8 1.4 0.8 0.4 0.5 0.5 0.4 0.4 0.4 0.5 0.8 0.5 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.5 0.6 0.6 0.7 0.5 0.4 0.5
0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.6 0.7 0.4 0.4 0.5 0.4 0.5 0.4 0.4 0.5 0.5 0.5 0.4 0.4 0.5 0.4 0.4 0.5 0.5 0.5 0.4 0.5 0.5 0.4 0.5 0.6
0.4 0.5 0.4 0.4 0.5 0.5 0.5 0.4 0.4 0.5 0.6 0.5 0.4 0.4 0.5 0.5 0.5 0.5 0.5 0.6 0.6 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.4 0.5 0.5 0.5 0.5 0.5 0.4
0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.7 0.6 0.5 0.5 0.5 0.5 0.5 0.5 0.6 0.5 0.5 0.6 1.0 0.7 0.6 0.7 0.8 0.8 0.6 0.7 0.8 0.7 0.6 0.5 0.5
0.7 0.6 0.7 0.7 0.9 1.1 1.0 0.7 0.8 0.8 0.8 0.8 0.7 0.6 0.7 0.9 1.4 2.0 2.2 2.5 2.5 2.5 2.3 1.9 2.0 1.9 2.0 2.6 2.1 2.0 1.8 1.4 1.2 1.2 0.9 0.7
0.9 0.8 0.9 1.2 1.3 1.0 1.1 1.3 1.1 0.7 0.7 0.7 0.7 0.7 0.8 0.9 0.9 1.0 1.3 1.4 1.5 1.6 1.7 1.9 2.1 2.3 2.2 1.9 1.5 1.2 1.2 1.4 1.5 1.5 1.1 1.0

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations



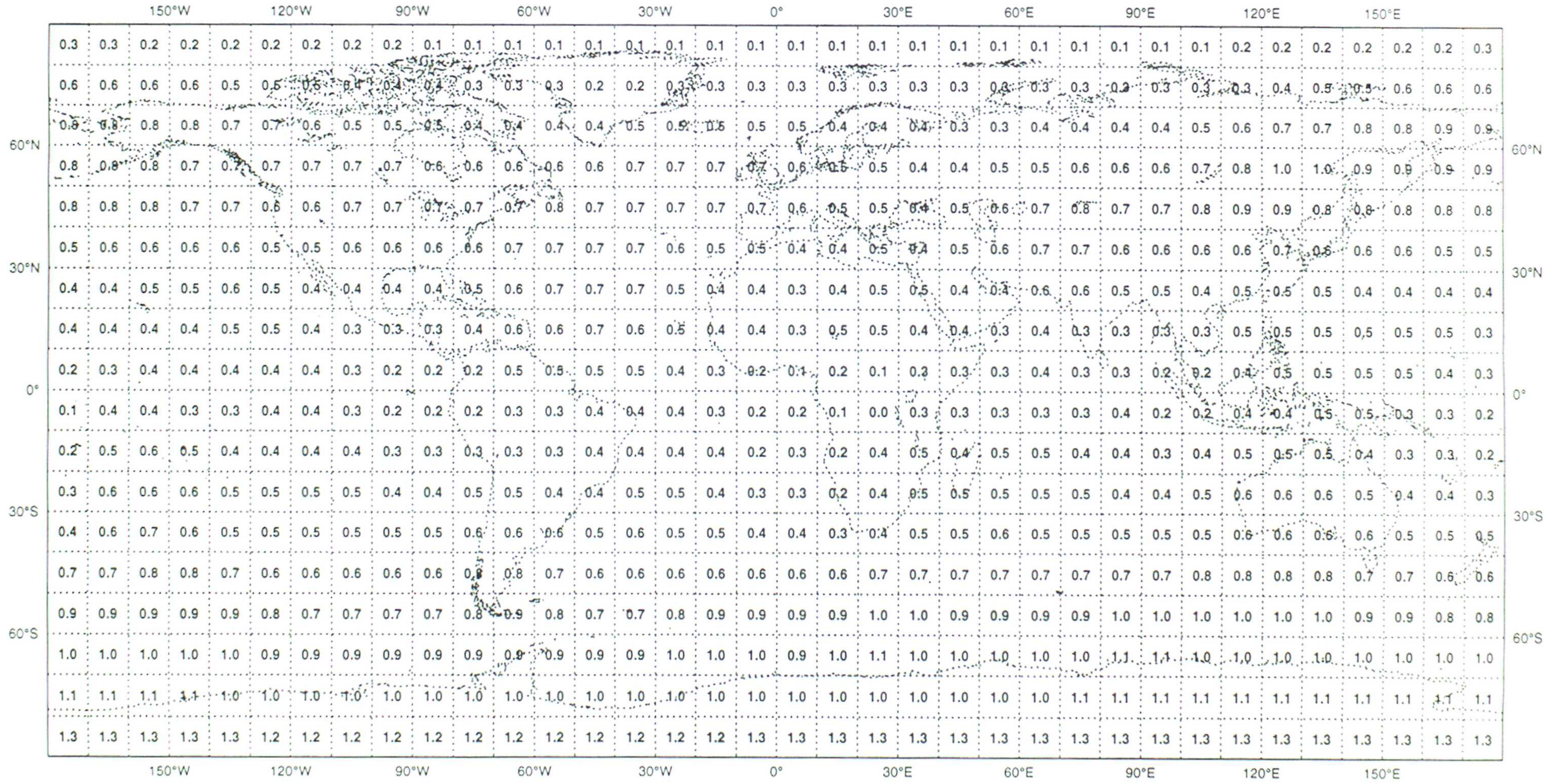
0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1
0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	-0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3
0.6	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.4	0.5	0.6
0.5	0.5	0.4	0.3	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.5	0.5	0.6	0.6
0.5	0.4	0.4	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.1	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.5	0.5	0.6	0.6	0.4	0.6
0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.3	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.2
0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0
0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0
0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-0.1
0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	-0.1	0.1	0.1	0.1	0.1	-0.1
-0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.2	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0
0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.1
0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.3
0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4
0.4	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.5	0.4	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.5
0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6
0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.6
0.8	0.8	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.0	0.9	0.8

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations



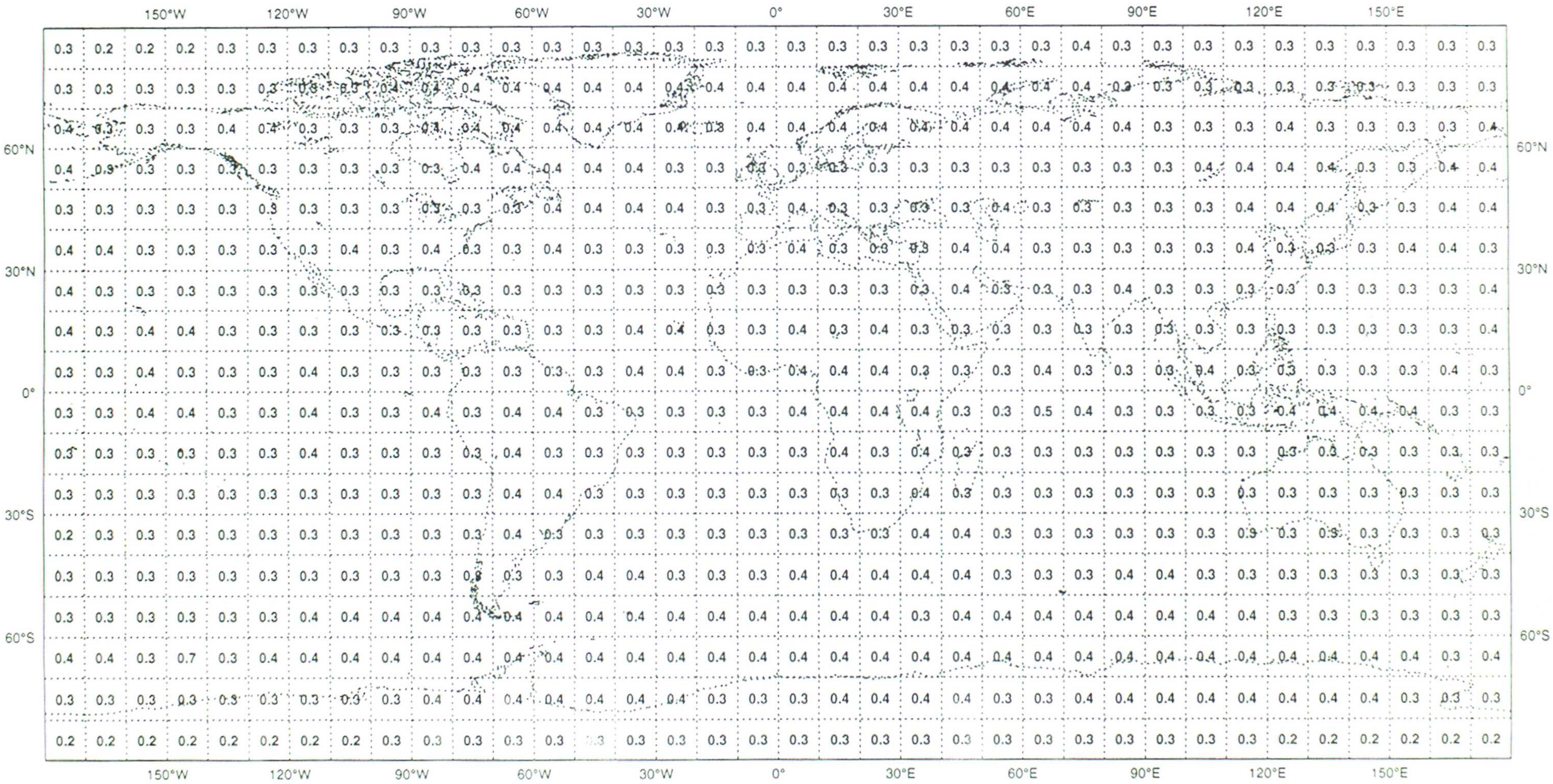
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.5
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5
0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.5	0.4	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5
0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.5	0.4	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4
0.4	0.4	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5
0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4
0.4	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations



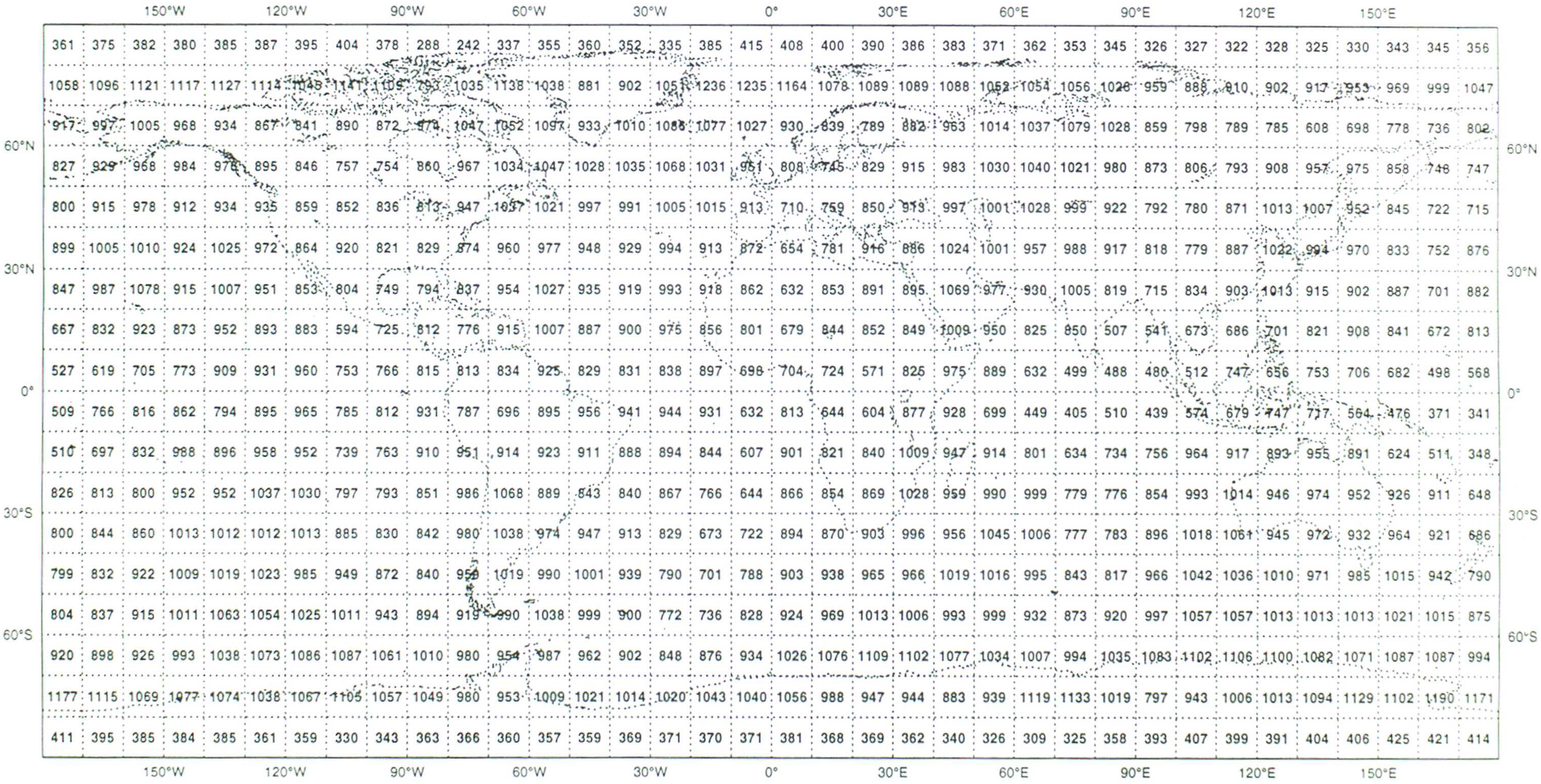
0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3
0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.6	0.6
0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.6	0.7	0.7	0.8	0.8	0.9	0.9
0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.5	0.5	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.8	1.0	1.0	0.9	0.9	0.9	0.9
0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.6	0.5	0.5	0.4	0.5	0.6	0.7	0.8	0.7	0.7	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.8
0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.5	0.5	0.4	0.4	0.5	0.4	0.5	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.5	0.5
0.4	0.4	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.5	0.6	0.7	0.7	0.7	0.5	0.4	0.4	0.3	0.4	0.5	0.5	0.4	0.4	0.6	0.6	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4
0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.3	0.3	0.3	0.4	0.6	0.6	0.7	0.6	0.5	0.4	0.4	0.3	0.5	0.5	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.3
0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.5	0.5	0.5	0.5	0.4	0.3	0.2	0.1	0.2	0.1	0.3	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.4	0.5	0.5	0.5	0.5	0.4	0.3
0.1	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.2	0.2	0.1	0.0	0.3	0.3	0.3	0.3	0.3	0.4	0.2	0.2	0.4	0.4	0.5	0.5	0.3	0.3	0.2
0.2	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.2	0.3	0.2	0.4	0.5	0.4	0.5	0.5	0.4	0.4	0.3	0.4	0.5	0.5	0.5	0.4	0.3	0.3	0.2
0.3	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.3	0.3	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.6	0.6	0.6	0.5	0.4	0.4	0.3
0.4	0.6	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.4	0.4	0.3	0.4	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5
0.7	0.7	0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.6
0.9	0.9	0.9	0.9	0.9	0.8	0.7	0.7	0.7	0.7	0.8	0.9	0.8	0.7	0.7	0.8	0.9	0.9	0.9	0.9	1.0	1.0	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8
1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	0.9	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations



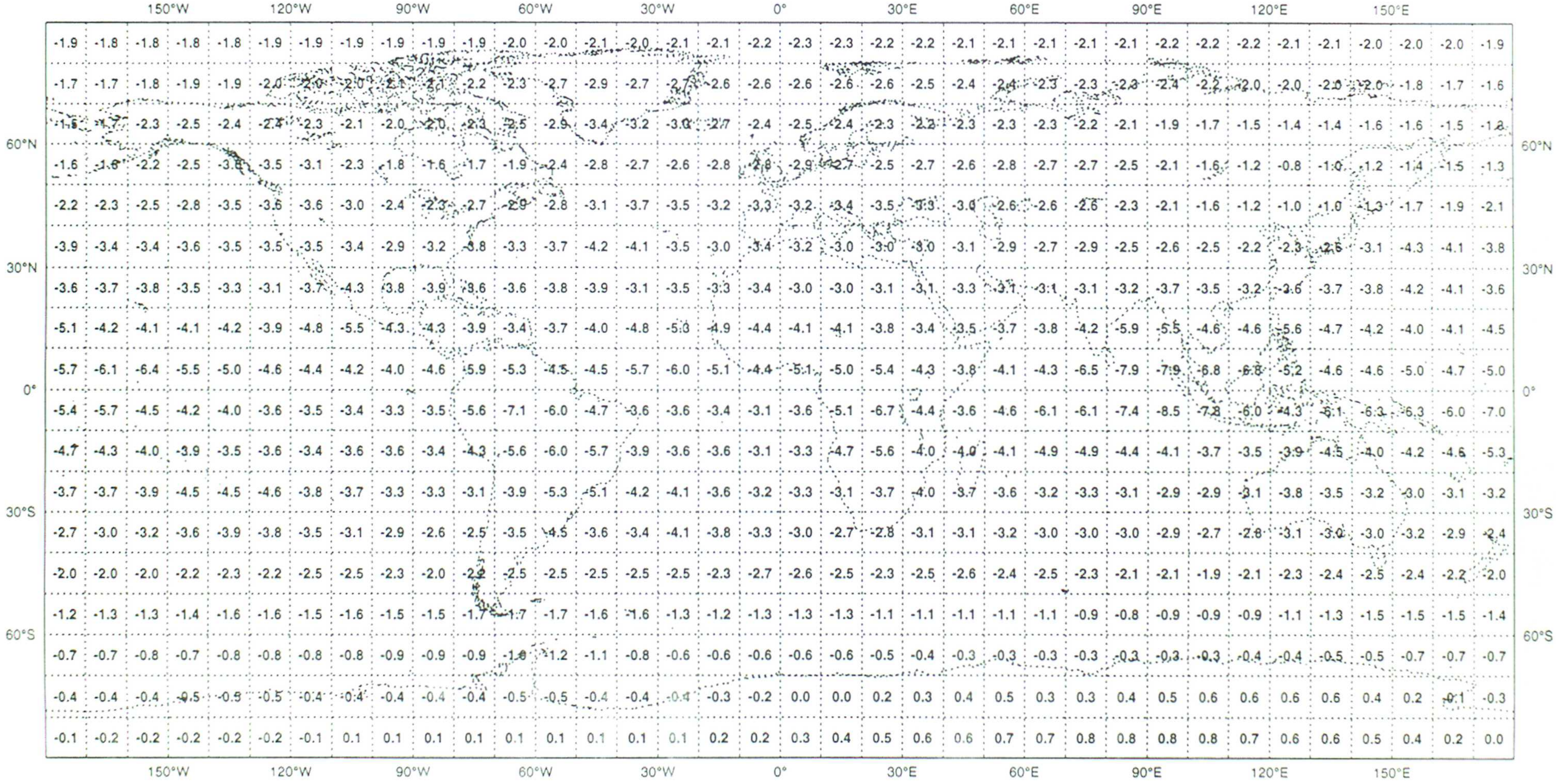
0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4
0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.4
0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.3
0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3
0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3
0.4	0.4	0.3	0.7	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2

Figure 40. ATOVS mean daily count. NOVEMBER 2002
NOAA16, using all observations
Global average number of observations in 24 hours = 545585



361	375	382	380	385	387	395	404	378	288	242	337	355	360	352	335	385	415	408	400	390	386	383	371	362	353	345	326	327	322	328	325	330	343	345	356
1058	1096	1121	1117	1127	1114	1048	1141	1109	793	1035	1138	1038	881	902	1051	1236	1235	1164	1078	1089	1089	1088	1052	1054	1056	1026	959	888	810	902	917	953	969	999	1047
917	997	1005	968	934	867	841	890	872	974	1047	1052	1097	933	1010	1088	1077	1027	930	839	789	882	963	1014	1037	1079	1028	859	798	789	785	608	698	778	736	802
827	929	968	984	978	895	846	757	754	860	967	1034	1047	1028	1035	1068	1031	951	808	745	829	915	983	1030	1040	1021	980	873	806	793	908	957	975	858	748	747
800	915	978	912	934	935	859	852	836	813	947	1037	1021	997	991	1005	1015	913	710	759	850	913	997	1001	1028	999	922	792	780	871	1013	1007	952	845	722	715
899	1005	1010	924	1025	972	864	920	821	829	874	960	977	948	929	994	913	872	654	781	916	886	1024	1001	957	988	917	818	779	887	1022	994	970	833	752	876
847	987	1078	915	1007	951	853	804	749	794	837	954	1027	935	919	993	918	862	632	853	891	895	1069	977	930	1005	819	715	834	903	1013	915	902	887	701	882
667	832	923	873	952	893	883	594	725	812	776	915	1007	887	900	975	856	801	679	844	852	849	1009	950	825	850	507	541	673	686	701	821	908	841	672	813
527	619	705	773	909	931	960	753	766	815	813	834	925	829	831	838	897	698	704	724	571	825	975	889	632	499	488	480	512	747	656	753	706	682	498	568
509	766	816	862	794	895	965	785	812	931	787	696	895	956	941	944	931	632	813	644	604	877	928	699	449	405	510	439	574	679	747	717	564	476	371	341
510	697	832	988	896	958	952	739	763	910	951	914	923	911	888	894	844	607	901	821	840	1009	947	914	801	634	734	756	964	917	893	955	891	624	511	348
826	813	800	952	952	1037	1030	797	793	851	986	1068	889	843	840	867	766	644	866	854	869	1028	959	990	999	779	776	854	993	1014	946	974	952	926	911	648
800	844	860	1013	1012	1012	1013	885	830	842	980	1038	974	947	913	829	673	722	894	870	903	996	956	1045	1006	777	783	896	1018	1061	945	972	932	964	921	686
799	832	922	1009	1019	1023	985	949	872	840	959	1019	990	1001	939	790	701	788	903	938	965	966	1019	1016	995	843	817	966	1042	1036	1010	971	985	1015	942	790
804	837	915	1011	1063	1054	1025	1011	943	894	919	990	1038	999	900	772	736	828	924	969	1013	1006	993	999	932	873	920	997	1057	1057	1013	1013	1013	1021	1015	875
920	898	926	993	1038	1073	1086	1087	1061	1010	980	954	987	962	902	848	876	934	1026	1076	1109	1102	1077	1034	1007	994	1035	1083	1102	1106	1100	1082	1071	1087	1087	994
1177	1115	1069	1077	1074	1038	1067	1105	1057	1049	980	953	1009	1021	1014	1020	1043	1040	1056	988	947	944	883	939	1119	1133	1019	797	943	1006	1013	1094	1129	1102	1190	1171
411	395	385	384	385	361	359	330	343	363	366	360	357	359	369	371	370	371	381	368	369	362	340	326	309	325	358	393	407	399	391	404	406	425	421	414

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: HIRS8 (Surface)
NOAA16, using all observations



-1.9	-1.8	-1.8	-1.8	-1.8	-1.9	-1.9	-1.9	-1.9	-1.9	-1.9	-2.0	-2.0	-2.1	-2.0	-2.1	-2.1	-2.2	-2.3	-2.3	-2.2	-2.2	-2.1	-2.1	-2.1	-2.1	-2.1	-2.2	-2.2	-2.2	-2.1	-2.1	-2.0	-2.0	-2.0	-1.9
-1.7	-1.7	-1.8	-1.9	-1.9	-2.0	-2.0	-2.0	-2.1	-2.1	-2.2	-2.3	-2.7	-2.9	-2.7	-2.7	-2.6	-2.6	-2.6	-2.6	-2.6	-2.5	-2.4	-2.4	-2.3	-2.3	-2.3	-2.4	-2.2	-2.0	-2.0	-2.0	-2.0	-1.8	-1.7	-1.6
-1.5	-1.7	-2.3	-2.5	-2.4	-2.4	-2.3	-2.1	-2.0	-2.0	-2.3	-2.5	-2.9	-3.4	-3.2	-3.0	-2.7	-2.4	-2.5	-2.4	-2.3	-2.2	-2.3	-2.3	-2.3	-2.2	-2.1	-1.9	-1.7	-1.5	-1.4	-1.4	-1.6	-1.6	-1.5	-1.2
-1.6	-1.6	-2.2	-2.5	-3.8	-3.5	-3.1	-2.3	-1.8	-1.6	-1.7	-1.9	-2.4	-2.8	-2.7	-2.6	-2.8	-2.8	-2.9	-2.7	-2.5	-2.7	-2.6	-2.8	-2.7	-2.7	-2.5	-2.1	-1.6	-1.2	-0.8	-1.0	-1.2	-1.4	-1.5	-1.3
-2.2	-2.3	-2.5	-2.8	-3.5	-3.6	-3.6	-3.0	-2.4	-2.3	-2.7	-2.9	-2.8	-3.1	-3.7	-3.5	-3.2	-3.3	-3.2	-3.4	-3.5	-3.3	-3.0	-2.6	-2.6	-2.6	-2.3	-2.1	-1.6	-1.2	-1.0	-1.0	-1.3	-1.7	-1.9	-2.1
-3.9	-3.4	-3.4	-3.6	-3.5	-3.5	-3.5	-3.4	-2.9	-3.2	-3.8	-3.3	-3.7	-4.2	-4.1	-3.5	-3.0	-3.4	-3.2	-3.0	-3.0	-3.0	-3.1	-2.9	-2.7	-2.9	-2.5	-2.6	-2.5	-2.2	-2.3	-2.6	-3.1	-4.3	-4.1	-3.8
-3.6	-3.7	-3.8	-3.5	-3.3	-3.1	-3.7	-4.3	-3.8	-3.9	-3.6	-3.6	-3.8	-3.9	-3.1	-3.5	-3.3	-3.4	-3.0	-3.0	-3.1	-3.1	-3.3	-3.1	-3.1	-3.1	-3.2	-3.7	-3.5	-3.2	-3.6	-3.7	-3.8	-4.2	-4.1	-3.6
-5.1	-4.2	-4.1	-4.1	-4.2	-3.9	-4.8	-5.5	-4.3	-4.3	-3.9	-3.4	-3.7	-4.0	-4.8	-5.0	-4.9	-4.4	-4.1	-4.1	-3.8	-3.4	-3.5	-3.7	-3.8	-4.2	-5.9	-5.5	-4.6	-4.6	-5.6	-4.7	-4.2	-4.0	-4.1	-4.5
-5.7	-6.1	-6.4	-5.5	-5.0	-4.6	-4.4	-4.2	-4.0	-4.6	-5.9	-5.3	-4.5	-4.5	-5.7	-6.0	-5.1	-4.4	-5.1	-5.0	-5.4	-4.3	-3.8	-4.1	-4.3	-6.5	-7.9	-7.9	-6.8	-6.8	-5.2	-4.6	-4.6	-5.0	-4.7	-5.0
-5.4	-5.7	-4.5	-4.2	-4.0	-3.6	-3.5	-3.4	-3.3	-3.5	-5.6	-7.1	-6.0	-4.7	-3.6	-3.6	-3.4	-3.1	-3.6	-5.1	-6.7	-4.4	-3.6	-4.6	-6.1	-6.1	-7.4	-8.5	-7.8	-6.0	-4.3	-6.1	-6.3	-6.3	-6.0	-7.0
-4.7	-4.3	-4.0	-3.9	-3.5	-3.6	-3.4	-3.6	-3.6	-3.4	-4.3	-5.6	-6.0	-5.7	-3.9	-3.6	-3.6	-3.1	-3.3	-4.7	-5.6	-4.0	-4.0	-4.1	-4.9	-4.9	-4.4	-4.1	-3.7	-3.5	-3.9	-4.5	-4.0	-4.2	-4.6	-5.3
-3.7	-3.7	-3.9	-4.5	-4.5	-4.6	-3.8	-3.7	-3.3	-3.3	-3.1	-3.9	-5.3	-5.1	-4.2	-4.1	-3.6	-3.2	-3.3	-3.1	-3.7	-4.0	-3.7	-3.6	-3.2	-3.3	-3.1	-2.9	-2.9	-3.1	-3.8	-3.5	-3.2	-3.0	-3.1	-3.2
-2.7	-3.0	-3.2	-3.6	-3.9	-3.8	-3.5	-3.1	-2.9	-2.6	-2.5	-3.5	-4.5	-3.6	-3.4	-4.1	-3.8	-3.3	-3.0	-2.7	-2.8	-3.1	-3.1	-3.2	-3.0	-3.0	-3.0	-2.9	-2.7	-2.8	-3.1	-3.0	-3.0	-3.2	-2.9	-2.4
-2.0	-2.0	-2.0	-2.2	-2.3	-2.2	-2.5	-2.5	-2.3	-2.0	-2.2	-2.5	-2.5	-2.5	-2.5	-2.5	-2.3	-2.7	-2.6	-2.5	-2.3	-2.5	-2.6	-2.4	-2.5	-2.3	-2.1	-2.1	-1.9	-2.1	-2.3	-2.4	-2.5	-2.4	-2.2	-2.0
-1.2	-1.3	-1.3	-1.4	-1.6	-1.6	-1.5	-1.6	-1.5	-1.5	-1.7	-1.7	-1.7	-1.6	-1.6	-1.3	-1.2	-1.3	-1.3	-1.3	-1.1	-1.1	-1.1	-1.1	-1.1	-0.9	-0.8	-0.9	-0.9	-0.9	-1.1	-1.3	-1.5	-1.5	-1.5	-1.4
-0.7	-0.7	-0.8	-0.7	-0.8	-0.8	-0.8	-0.8	-0.9	-0.9	-0.9	-1.0	-1.2	-1.1	-0.8	-0.6	-0.6	-0.6	-0.6	-0.6	-0.5	-0.4	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.4	-0.4	-0.5	-0.5	-0.7	-0.7	-0.7
-0.4	-0.4	-0.4	-0.5	-0.5	-0.5	-0.4	-0.4	-0.4	-0.4	-0.4	-0.5	-0.5	-0.4	-0.4	-0.4	-0.3	-0.2	0.0	0.0	0.2	0.3	0.4	0.5	0.3	0.3	0.4	0.5	0.6	0.6	0.6	0.6	0.4	0.2	-0.1	-0.3
-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.6	0.6	0.5	0.4	0.2	0.0

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: HIRS8 (Surface)
NOAA16, using all observations

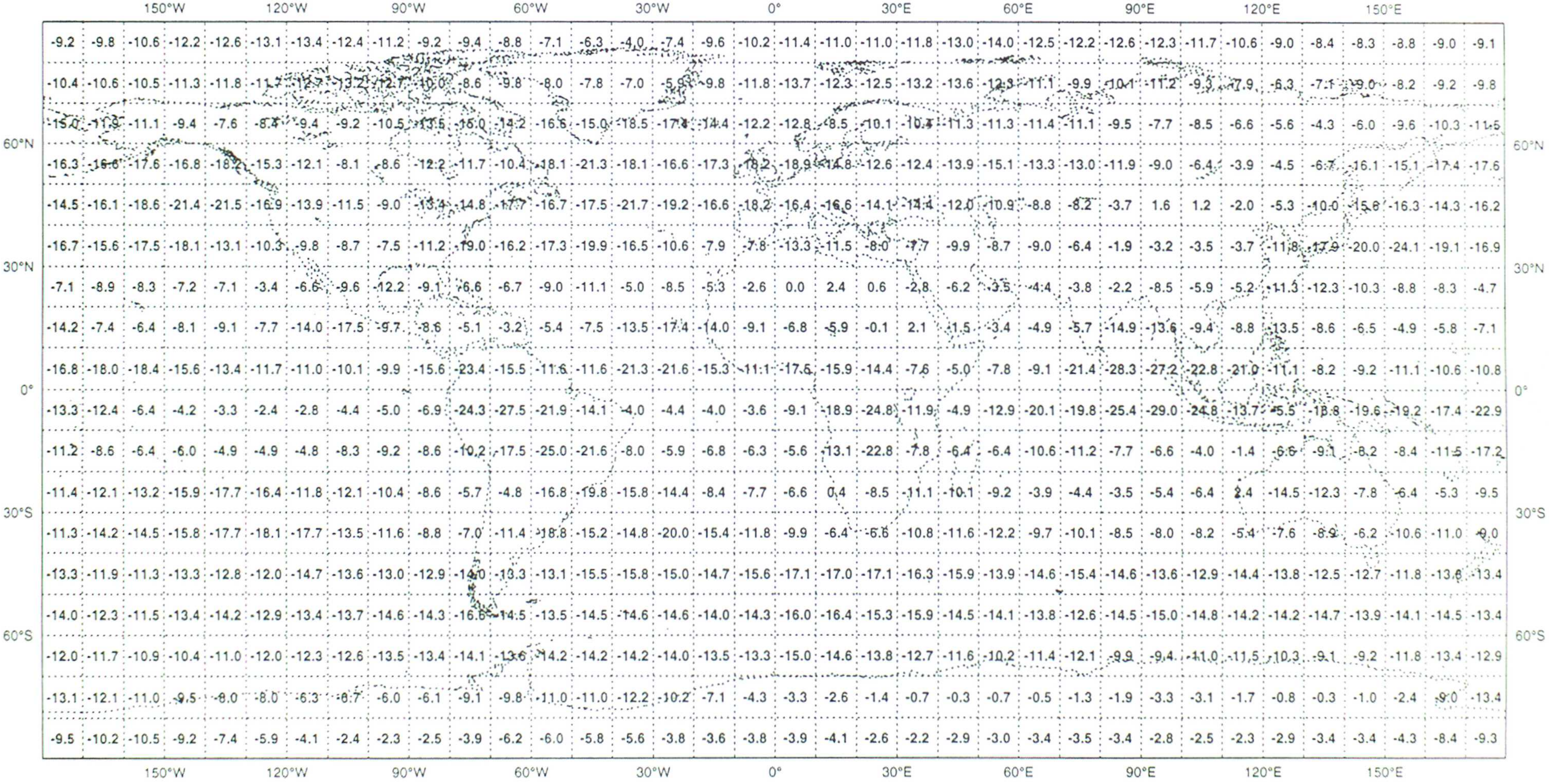
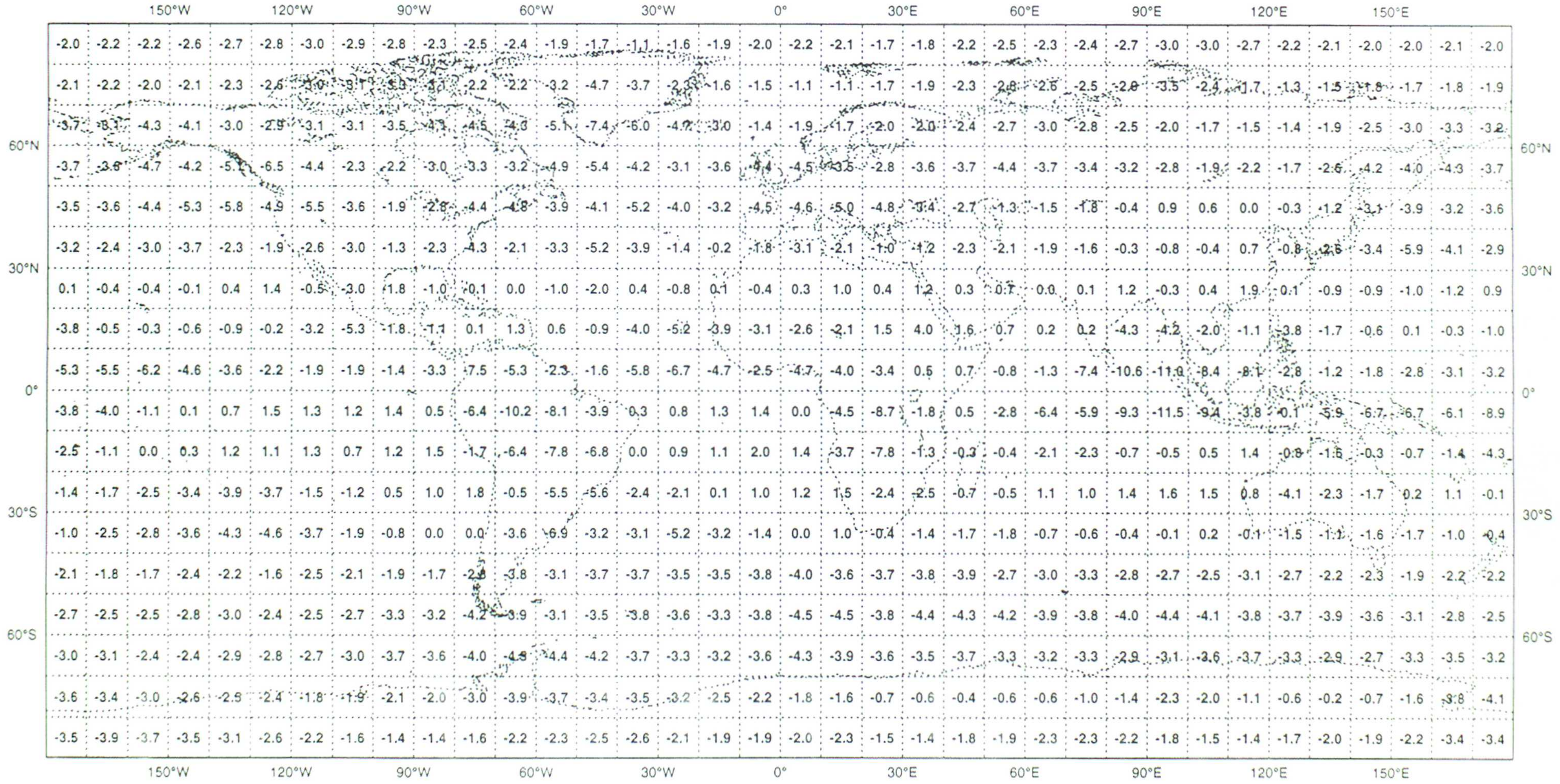
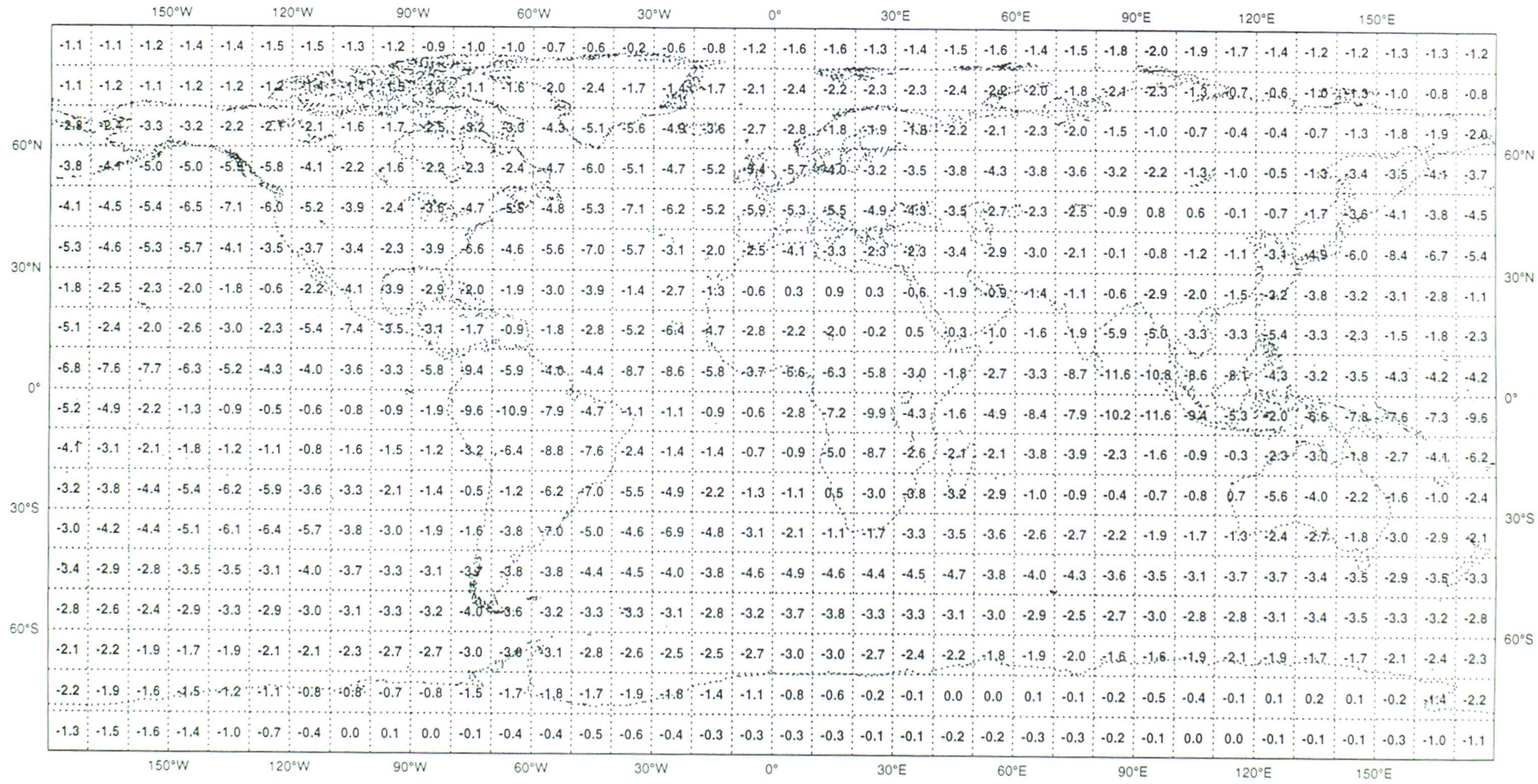

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-9.2 -9.8 -10.6 -12.2 -12.6 -13.1 -13.4 -12.4 -11.2 -9.2 -9.4 -8.8 -7.1 -6.3 -4.0 -7.4 -9.6 -10.2 -11.4 -11.0 -11.0 -11.8 -13.0 -14.0 -12.5 -12.2 -12.6 -12.3 -11.7 -10.6 -9.0 -8.4 -8.3 -8.8 -9.0 -9.1
-10.4 -10.6 -10.5 -11.3 -11.8 -11.7 -12.7 -13.2 -12.7 -10.0 -8.6 -9.8 -8.0 -7.8 -7.0 -5.9 -9.8 -11.8 -13.7 -12.3 -12.5 -13.2 -13.6 -12.3 -11.1 -9.9 -10.1 -11.2 -9.3 -7.9 -6.3 -7.1 -9.0 -8.2 -9.2 -9.8
-15.0 -11.9 -11.1 -9.4 -7.6 -8.4 -9.4 -9.2 -10.5 -13.5 -16.0 -14.2 -16.6 -15.0 -18.5 -17.4 -14.4 -12.2 -12.8 -8.5 -10.1 -10.4 -11.3 -11.3 -11.4 -11.1 -9.5 -7.7 -8.5 -6.6 -5.6 -4.3 -6.0 -9.6 -10.3 -11.5
-16.3 -16.6 -17.6 -16.8 -18.2 -15.3 -12.1 -8.1 -8.6 -12.2 -11.7 -10.4 -18.1 -21.3 -18.1 -16.6 -17.3 -18.2 -18.9 -14.8 -12.6 -12.4 -13.9 -15.1 -13.3 -13.0 -11.9 -9.0 -6.4 -3.9 -4.5 -6.7 -16.1 -15.1 -17.4 -17.6
-14.5 -16.1 -18.6 -21.4 -21.5 -16.9 -13.9 -11.5 -9.0 -13.4 -14.8 -17.7 -16.7 -17.5 -21.7 -19.2 -16.6 -18.2 -16.4 -16.6 -14.1 -14.4 -12.0 -10.9 -8.8 -8.2 -3.7 1.6 1.2 -2.0 -5.3 -10.0 -15.6 -16.3 -14.3 -16.2
-16.7 -15.6 -17.5 -18.1 -13.1 -10.3 -9.8 -8.7 -7.5 -11.2 -19.0 -16.2 -17.3 -19.9 -16.5 -10.6 -7.9 -7.8 -13.3 -11.5 -8.0 -7.7 -9.9 -8.7 -9.0 -6.4 -1.9 -3.2 -3.5 -3.7 -11.8 -17.9 -20.0 -24.1 -19.1 -16.9
-7.1 -8.9 -8.3 -7.2 -7.1 -3.4 -6.6 -9.6 -12.2 -9.1 -6.6 -6.7 -9.0 -11.1 -5.0 -8.5 -5.3 -2.6 0.0 2.4 0.6 -2.8 -6.2 -3.5 -4.4 -3.8 -2.2 -8.5 -5.9 -5.2 -11.3 -12.3 -10.3 -8.8 -8.3 -4.7
-14.2 -7.4 -6.4 -8.1 -9.1 -7.7 -14.0 -17.5 -9.7 -8.6 -5.1 -3.2 -5.4 -7.5 -13.5 -17.4 -14.0 -9.1 -6.8 -5.9 -0.1 2.1 -1.5 -3.4 -4.9 -5.7 -14.9 -13.6 -9.4 -8.8 -13.5 -8.6 -6.5 -4.9 -5.8 -7.1
-16.8 -18.0 -18.4 -15.6 -13.4 -11.7 -11.0 -10.1 -9.9 -15.6 -23.4 -15.5 -11.6 -11.6 -21.3 -21.6 -15.3 -11.1 -17.6 -15.9 -14.4 -7.6 -5.0 -7.8 -9.1 -21.4 -28.3 -27.2 -22.8 -21.0 -11.1 -8.2 -9.2 -11.1 -10.6 -10.8
-13.3 -12.4 -6.4 -4.2 -3.3 -2.4 -2.8 -4.4 -5.0 -6.9 -24.3 -27.5 -21.9 -14.1 -4.0 -4.4 -4.0 -3.6 -9.1 -18.9 -24.8 -11.9 -4.9 -12.9 -20.1 -19.8 -25.4 -29.0 -24.8 -13.7 -5.5 -18.8 -19.6 -19.2 -17.4 -22.9
-11.2 -8.6 -6.4 -6.0 -4.9 -4.9 -4.8 -8.3 -9.2 -8.6 -10.2 -17.5 -25.0 -21.6 -8.0 -5.9 -6.8 -6.3 -5.6 -13.1 -22.8 -7.8 -6.4 -6.4 -10.6 -11.2 -7.7 -6.6 -4.0 -1.4 -6.6 -9.1 -8.2 -8.4 -11.5 -17.2
-11.4 -12.1 -13.2 -15.9 -17.7 -16.4 -11.8 -12.1 -10.4 -8.6 -5.7 -4.8 -16.8 -19.8 -15.8 -14.4 -8.4 -7.7 -6.6 0.4 -8.5 -11.1 -10.1 -9.2 -3.9 -4.4 -3.5 -5.4 -6.4 2.4 -14.5 -12.3 -7.8 -6.4 -5.3 -9.5
-11.3 -14.2 -14.5 -15.8 -17.7 -18.1 -17.7 -13.5 -11.6 -8.8 -7.0 -11.4 -18.8 -15.2 -14.8 -20.0 -15.4 -11.8 -9.9 -6.4 -6.6 -10.8 -11.6 -12.2 -9.7 -10.1 -8.5 -8.0 -8.2 -5.4 -7.6 -8.9 -6.2 -10.6 -11.0 -9.0
-13.3 -11.9 -11.3 -13.3 -12.8 -12.0 -14.7 -13.6 -13.0 -12.9 -14.0 -13.3 -13.1 -15.5 -15.8 -15.0 -14.7 -15.6 -17.1 -17.0 -17.1 -16.3 -15.9 -13.9 -14.6 -15.4 -14.6 -13.6 -12.9 -14.4 -13.8 -12.5 -12.7 -11.8 -13.6 -13.4
-14.0 -12.3 -11.5 -13.4 -14.2 -12.9 -13.4 -13.7 -14.6 -14.3 -16.6 -14.5 -13.5 -14.5 -14.6 -14.6 -14.0 -14.3 -16.0 -16.4 -15.3 -15.9 -14.5 -14.1 -13.8 -12.6 -14.5 -15.0 -14.8 -14.2 -14.2 -14.7 -13.9 -14.1 -14.5 -13.4
-12.0 -11.7 -10.9 -10.4 -11.0 -12.0 -12.3 -12.6 -13.5 -13.4 -14.1 -13.6 -14.2 -14.2 -14.2 -14.0 -13.5 -13.3 -15.0 -14.6 -13.8 -12.7 -11.6 -10.2 -11.4 -12.1 -9.9 -9.4 -11.0 -11.5 -10.3 -9.1 -9.2 -11.8 -13.4 -12.9
-13.1 -12.1 -11.0 -9.5 -8.0 -8.0 -6.3 -6.7 -6.0 -6.1 -9.1 -9.8 -11.0 -11.0 -12.2 -10.2 -7.1 -4.3 -3.3 -2.6 -1.4 -0.7 -0.3 -0.7 -0.5 -1.3 -1.9 -3.3 -3.1 -1.7 -0.8 -0.3 -1.0 -2.4 -9.0 -13.4
-9.5 -10.2 -10.5 -9.2 -7.4 -5.9 -4.1 -2.4 -2.3 -2.5 -3.9 -6.2 -6.0 -5.8 -5.6 -3.8 -3.6 -3.8 -3.9 -4.1 -2.6 -2.2 -2.9 -3.0 -3.4 -3.5 -3.4 -2.8 -2.5 -2.3 -2.9 -3.4 -3.4 -4.3 -8.4 -9.3

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



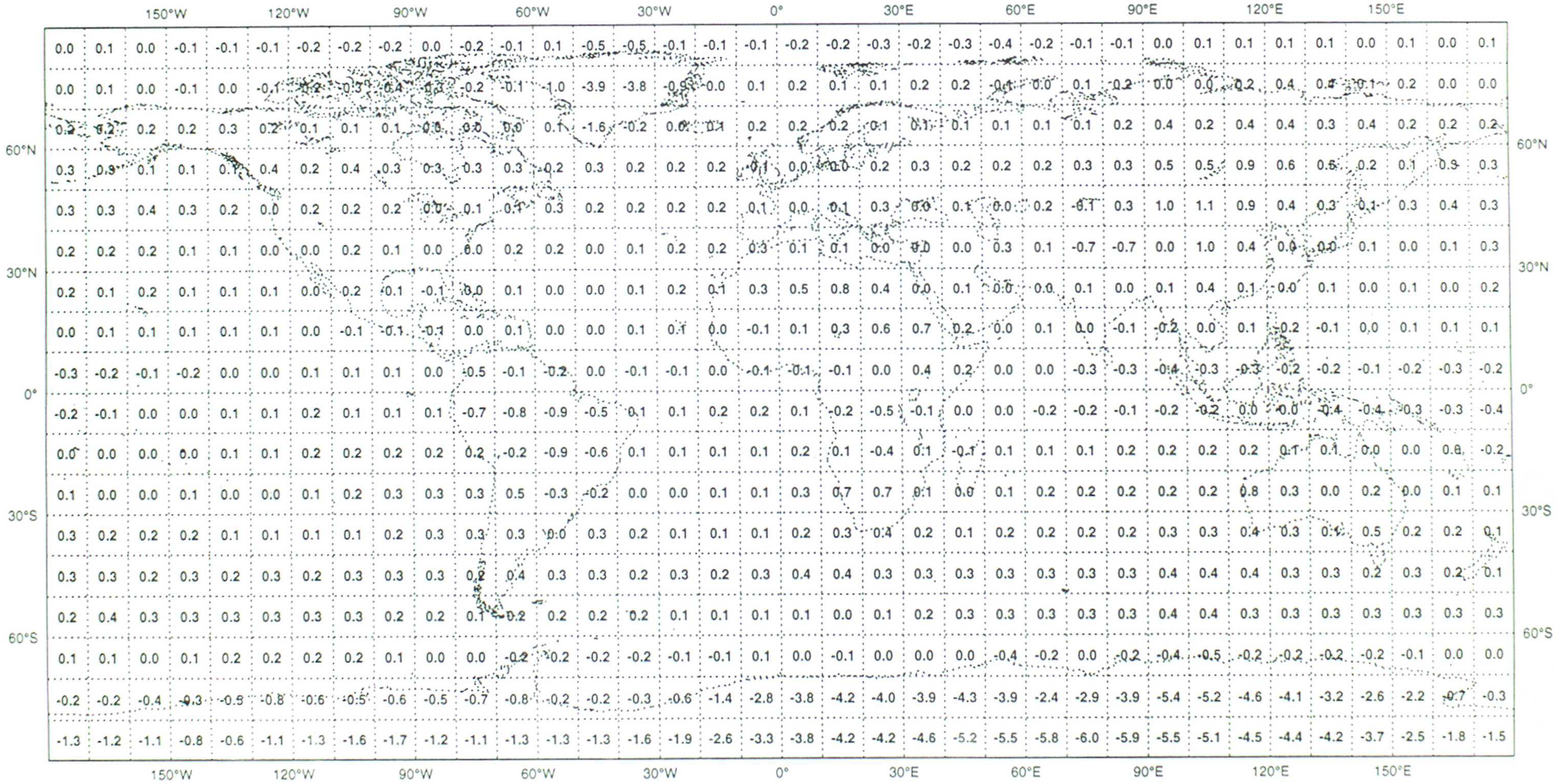
-2.0	-2.2	-2.2	-2.6	-2.7	-2.8	-3.0	-2.9	-2.8	-2.3	-2.5	-2.4	-1.9	-1.7	-1.1	-1.6	-1.9	-2.0	-2.2	-2.1	-1.7	-1.8	-2.2	-2.5	-2.3	-2.4	-2.7	-3.0	-3.0	-2.7	-2.2	-2.1	-2.0	-2.0	-2.1	-2.0
-2.1	-2.2	-2.0	-2.1	-2.3	-2.6	-3.0	-3.1	-3.0	-3.1	-2.2	-2.2	-3.2	-4.7	-3.7	-2.3	-1.6	-1.5	-1.1	-1.1	-1.7	-1.9	-2.3	-2.8	-2.6	-2.5	-2.8	-3.5	-2.4	-1.7	-1.3	-1.5	-1.8	-1.7	-1.8	-1.9
-3.7	-3.1	-4.3	-4.1	-3.0	-2.9	-3.1	-3.1	-3.5	-4.1	-4.5	-4.3	-5.1	-7.4	-6.0	-4.7	-3.0	-1.4	-1.9	-1.7	-2.0	-2.0	-2.4	-2.7	-3.0	-2.8	-2.5	-2.0	-1.7	-1.5	-1.4	-1.9	-2.5	-3.0	-3.3	-3.2
-3.7	-3.6	-4.7	-4.2	-5.1	-6.5	-4.4	-2.3	-2.2	-3.0	-3.3	-3.2	-4.9	-5.4	-4.2	-3.1	-3.6	-4.4	-4.5	-3.5	-2.8	-3.6	-3.7	-4.4	-3.7	-3.4	-3.2	-2.8	-1.9	-2.2	-1.7	-2.6	-4.2	-4.0	-4.3	-3.7
-3.5	-3.6	-4.4	-5.3	-5.8	-4.9	-5.5	-3.6	-1.9	-2.8	-4.4	-4.8	-3.9	-4.1	-5.2	-4.0	-3.2	-4.5	-4.6	-5.0	-4.8	-3.4	-2.7	-1.3	-1.5	-1.8	-0.4	0.9	0.6	0.0	-0.3	-1.2	-3.1	-3.9	-3.2	-3.6
-3.2	-2.4	-3.0	-3.7	-2.3	-1.9	-2.6	-3.0	-1.3	-2.3	-4.3	-2.1	-3.3	-5.2	-3.9	-1.4	-0.2	-1.8	-3.1	-2.1	-1.0	-1.2	-2.3	-2.1	-1.9	-1.6	-0.3	-0.8	-0.4	0.7	-0.8	-2.6	-3.4	-5.9	-4.1	-2.9
0.1	-0.4	-0.4	-0.1	0.4	1.4	-0.5	-3.0	1.8	-1.0	0.1	0.0	-1.0	-2.0	0.4	-0.8	0.1	-0.4	0.3	1.0	0.4	1.2	0.3	0.7	0.0	0.1	1.2	-0.3	0.4	1.9	-0.1	-0.9	-0.9	-1.0	-1.2	0.9
-3.8	-0.5	-0.3	-0.6	-0.9	-0.2	-3.2	-5.3	-1.8	-1.1	0.1	1.3	0.6	-0.9	-4.0	-5.2	-3.9	-3.1	-2.6	-2.1	1.5	4.0	1.6	0.7	0.2	0.2	-4.3	-4.2	-2.0	-1.1	-3.8	-1.7	-0.6	0.1	-0.3	-1.0
-5.3	-5.5	-6.2	-4.6	-3.6	-2.2	-1.9	-1.9	-1.4	-3.3	-7.5	-5.3	-2.3	-1.6	-5.8	-6.7	-4.7	-2.5	-4.7	-4.0	-3.4	0.5	0.7	-0.8	-1.3	-7.4	-10.6	-11.0	-8.4	-8.1	-2.8	-1.2	-1.8	-2.8	-3.1	-3.2
-3.8	-4.0	-1.1	0.1	0.7	1.5	1.3	1.2	1.4	0.5	-6.4	-10.2	-8.1	-3.9	0.3	0.8	1.3	1.4	0.0	-4.5	-8.7	-1.8	0.5	-2.8	-6.4	-5.9	-9.3	-11.5	-9.4	-3.8	-0.1	-5.9	-6.7	-6.7	-6.1	-8.9
-2.5	-1.1	0.0	0.3	1.2	1.1	1.3	0.7	1.2	1.5	-1.7	-6.4	-7.8	-6.8	0.0	0.9	1.1	2.0	1.4	-3.7	-7.8	-1.3	-0.3	-0.4	-2.1	-2.3	-0.7	-0.5	0.5	1.4	-0.8	-1.6	-0.3	-0.7	-1.4	-4.3
-1.4	-1.7	-2.5	-3.4	-3.9	-3.7	-1.5	-1.2	0.5	1.0	1.8	-0.5	-5.5	-5.6	-2.4	-2.1	0.1	1.0	1.2	1.5	-2.4	-2.5	-0.7	-0.5	1.1	1.0	1.4	1.6	1.5	0.8	-4.1	-2.3	-1.7	0.2	1.1	-0.1
-1.0	-2.5	-2.8	-3.6	-4.3	-4.6	-3.7	-1.9	-0.8	0.0	0.0	-3.6	-6.9	-3.2	-3.1	-5.2	-3.2	-1.4	0.0	1.0	-0.4	-1.4	-1.7	-1.8	-0.7	-0.6	-0.4	-0.1	0.2	-0.1	-1.5	-1.1	-1.6	-1.7	-1.0	-0.4
-2.1	-1.8	-1.7	-2.4	-2.2	-1.6	-2.5	-2.1	-1.9	-1.7	-2.8	-3.8	-3.1	-3.7	-3.7	-3.5	-3.5	-3.8	-4.0	-3.6	-3.7	-3.8	-3.9	-2.7	-3.0	-3.3	-2.8	-2.7	-2.5	-3.1	-2.7	-2.2	-2.3	-1.9	-2.2	-2.2
-2.7	-2.5	-2.5	-2.8	-3.0	-2.4	-2.5	-2.7	-3.3	-3.2	-4.2	-3.9	-3.1	-3.5	-3.8	-3.6	-3.3	-3.8	-4.5	-4.5	-3.8	-4.4	-4.3	-4.2	-3.9	-3.8	-4.0	-4.4	-4.1	-3.8	-3.7	-3.9	-3.6	-3.1	-2.8	-2.5
-3.0	-3.1	-2.4	-2.4	-2.9	-2.8	-2.7	-3.0	-3.7	-3.6	-4.0	-4.8	-4.4	-4.2	-3.7	-3.3	-3.2	-3.6	-4.3	-3.9	-3.6	-3.5	-3.7	-3.3	-3.2	-3.3	-2.9	-3.1	-3.6	-3.7	-3.3	-2.9	-2.7	-3.3	-3.5	-3.2
-3.6	-3.4	-3.0	-2.6	-2.5	-2.4	-1.8	-1.9	-2.1	-2.0	-3.0	-3.9	-3.7	-3.4	-3.5	-3.2	-2.5	-2.2	-1.8	-1.6	-0.7	-0.6	-0.4	-0.6	-0.6	-1.0	-1.4	-2.3	-2.0	-1.1	-0.6	-0.2	-0.7	-1.6	-3.8	-4.1
-3.5	-3.9	-3.7	-3.5	-3.1	-2.6	-2.2	-1.6	-1.4	-1.4	-1.6	-2.2	-2.3	-2.5	-2.6	-2.1	-1.9	-1.9	-2.0	-2.3	-1.5	-1.4	-1.8	-1.9	-2.3	-2.3	-2.2	-1.8	-1.5	-1.4	-1.7	-2.0	-1.9	-2.2	-3.4	-3.4

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



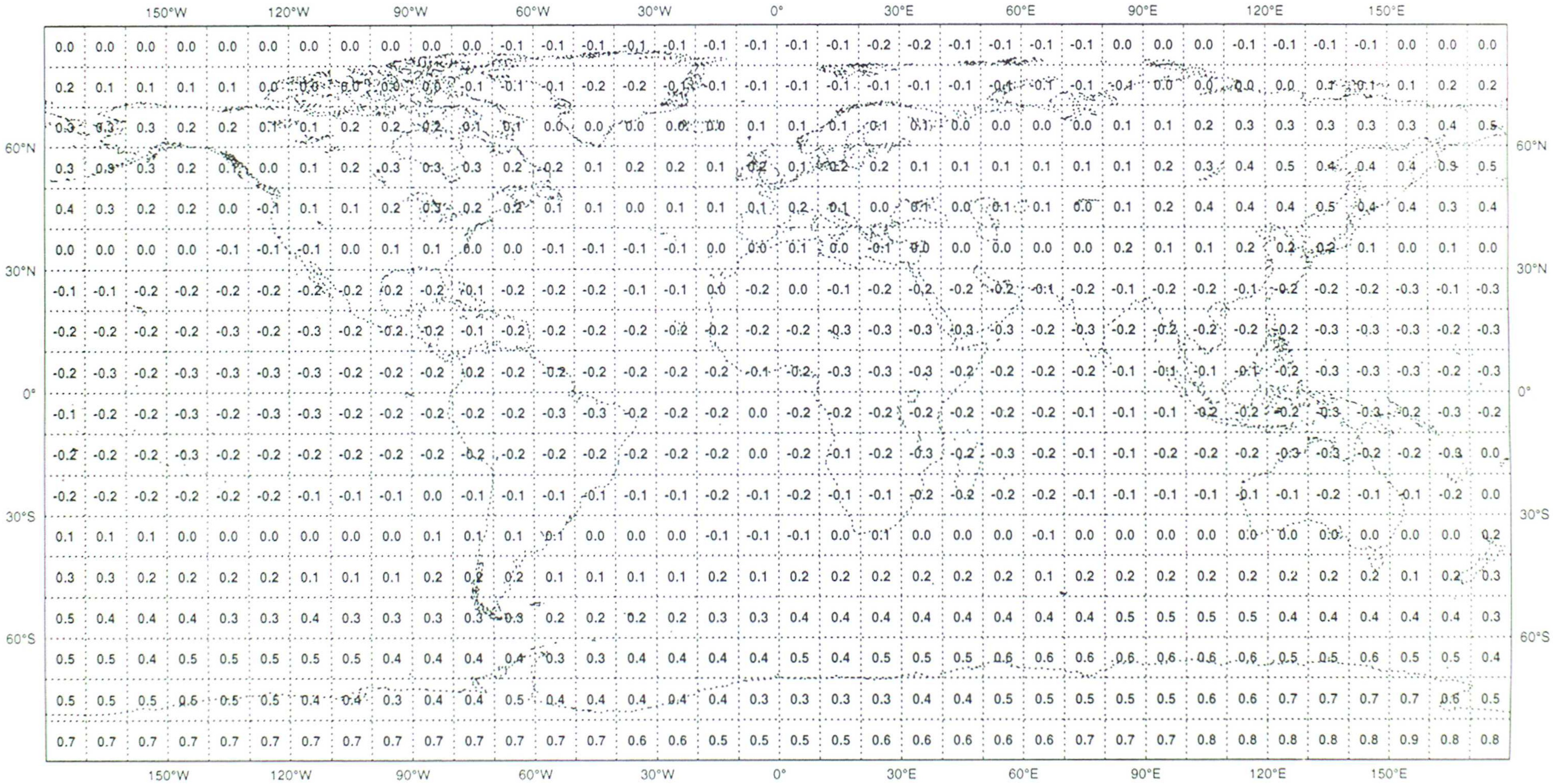
-1.1	-1.1	-1.2	-1.4	-1.4	-1.5	-1.5	-1.3	-1.2	-0.9	-1.0	-1.0	-0.7	-0.6	-0.2	-0.6	-0.8	-1.2	-1.6	-1.6	-1.3	-1.4	-1.5	-1.6	-1.4	-1.5	-1.8	-2.0	-1.9	-1.7	-1.4	-1.2	-1.2	-1.3	-1.3	-1.2
-1.1	-1.2	-1.1	-1.2	-1.2	-1.2	-1.4	-1.4	-1.5	-1.3	-1.1	-1.6	-2.0	-2.4	-1.7	-1.4	-1.7	-2.1	-2.4	-2.2	-2.3	-2.3	-2.4	-2.2	-2.0	-1.8	-2.4	-2.3	-1.3	-0.7	-0.6	-1.0	-1.3	-1.0	-0.8	-0.8
-2.8	-2.4	-3.3	-3.2	-2.2	-2.1	-2.1	-1.6	-1.7	-2.5	-3.2	-3.3	-4.3	-5.1	-5.6	-4.9	-3.6	-2.7	-2.8	-1.8	-1.9	-1.8	-2.2	-2.1	-2.3	-2.0	-1.5	-1.0	-0.7	-0.4	-0.4	-0.7	-1.3	-1.8	-1.9	-2.0
-3.8	-4.1	-5.0	-5.0	-5.9	-5.8	-4.1	-2.2	-1.6	-2.2	-2.3	-2.4	-4.7	-6.0	-5.1	-4.7	-5.2	-5.4	-5.7	-4.0	-3.2	-3.5	-3.8	-4.3	-3.8	-3.6	-3.2	-2.2	-1.3	-1.0	-0.5	-1.3	-3.4	-3.5	-4.1	-3.7
-4.1	-4.5	-5.4	-6.5	-7.1	-6.0	-5.2	-3.9	-2.4	-3.6	-4.7	-5.5	-4.8	-5.3	-7.1	-6.2	-5.2	-5.9	-5.3	-5.5	-4.9	-4.3	-3.5	-2.7	-2.3	-2.5	-0.9	0.8	0.6	-0.1	-0.7	-1.7	-3.6	-4.1	-3.8	-4.5
-5.3	-4.6	-5.3	-5.7	-4.1	-3.5	-3.7	-3.4	-2.3	-3.9	-6.6	-4.6	-5.6	-7.0	-5.7	-3.1	-2.0	-2.5	-4.1	-3.3	-2.3	-2.3	-3.4	-2.9	-3.0	-2.1	-0.1	-0.8	-1.2	-1.1	-3.1	-4.9	-6.0	-8.4	-6.7	-5.4
-1.8	-2.5	-2.3	-2.0	-1.8	-0.6	-2.2	-4.1	-3.9	-2.9	-2.0	-1.9	-3.0	-3.9	-1.4	-2.7	-1.3	-0.6	0.3	0.9	0.3	-0.6	-1.9	-0.9	-1.4	-1.1	-0.6	-2.9	-2.0	-1.5	-3.2	-3.8	-3.2	-3.1	-2.8	-1.1
-5.1	-2.4	-2.0	-2.6	-3.0	-2.3	-5.4	-7.4	-3.5	-3.1	-1.7	-0.9	-1.8	-2.8	-5.2	-6.4	-4.7	-2.8	-2.2	-2.0	-0.2	0.5	-0.3	-1.0	-1.6	-1.9	-5.9	-5.0	-3.3	-3.3	-5.4	-3.3	-2.3	-1.5	-1.8	-2.3
-6.8	-7.6	-7.7	-6.3	-5.2	-4.3	-4.0	-3.6	-3.3	-5.8	-9.4	-5.9	-4.0	-4.4	-8.7	-8.6	-5.8	-3.7	-6.6	-6.3	-5.8	-3.0	-1.8	-2.7	-3.3	-8.7	-11.6	-10.8	-8.6	-8.1	-4.3	-3.2	-3.5	-4.3	-4.2	-4.2
-5.2	-4.9	-2.2	-1.3	-0.9	-0.5	-0.6	-0.8	-0.9	-1.9	-9.6	-10.9	-7.9	-4.7	-1.1	-1.1	-0.9	-0.6	-2.8	-7.2	-9.9	-4.3	-1.6	-4.9	-8.4	-7.9	-10.2	-11.6	-9.4	-5.3	-2.0	-6.6	-7.8	-7.6	-7.3	-9.6
-4.1	-3.1	-2.1	-1.8	-1.2	-1.1	-0.8	-1.6	-1.5	-1.2	-3.2	-6.4	-8.8	-7.6	-2.4	-1.4	-1.4	-0.7	-0.9	-5.0	-8.7	-2.6	-2.1	-2.1	-3.8	-3.9	-2.3	-1.6	-0.9	-0.3	-2.3	-3.0	-1.8	-2.7	-4.1	-6.2
-3.2	-3.8	-4.4	-5.4	-6.2	-5.9	-3.6	-3.3	-2.1	-1.4	-0.5	-1.2	-6.2	-7.0	-5.5	-4.9	-2.2	-1.3	-1.1	0.5	-3.0	-3.8	-3.2	-2.9	-1.0	-0.9	-0.4	-0.7	-0.8	0.7	-5.6	-4.0	-2.2	-1.6	-1.0	-2.4
-3.0	-4.2	-4.4	-5.1	-6.1	-6.4	-5.7	-3.8	-3.0	-1.9	-1.6	-3.8	-7.0	-5.0	-4.6	-6.9	-4.8	-3.1	-2.1	-1.1	-1.7	-3.3	-3.5	-3.6	-2.6	-2.7	-2.2	-1.9	-1.7	-1.3	-2.4	-2.7	-1.8	-3.0	-2.9	-2.1
-3.4	-2.9	-2.8	-3.5	-3.5	-3.1	-4.0	-3.7	-3.3	-3.1	-3.7	-3.8	-3.8	-4.4	-4.5	-4.0	-3.8	-4.6	-4.9	-4.6	-4.4	-4.5	-4.7	-3.8	-4.0	-4.3	-3.6	-3.5	-3.1	-3.7	-3.7	-3.4	-3.5	-2.9	-3.5	-3.3
-2.8	-2.6	-2.4	-2.9	-3.3	-2.9	-3.0	-3.1	-3.3	-3.2	-4.0	-3.6	-3.2	-3.3	-3.3	-3.1	-2.8	-3.2	-3.7	-3.8	-3.3	-3.3	-3.1	-3.0	-2.9	-2.5	-2.7	-3.0	-2.8	-2.8	-3.1	-3.4	-3.5	-3.3	-3.2	-2.8
-2.1	-2.2	-1.9	-1.7	-1.9	-2.1	-2.1	-2.3	-2.7	-2.7	-3.0	-3.0	-3.1	-2.8	-2.6	-2.5	-2.5	-2.7	-3.0	-3.0	-2.7	-2.4	-2.2	-1.8	-1.9	-2.0	-1.6	-1.6	-1.9	-2.1	-1.9	-1.7	-1.7	-2.1	-2.4	-2.3
-2.2	-1.9	-1.6	-1.5	-1.2	-1.1	-0.8	-0.8	-0.7	-0.8	-1.5	-1.7	-1.8	-1.7	-1.9	-1.8	-1.4	-1.1	-0.8	-0.6	-0.2	-0.1	0.0	0.0	0.1	-0.1	-0.2	-0.5	-0.4	-0.1	0.1	0.2	0.1	-0.2	-1.4	-2.2
-1.3	-1.5	-1.6	-1.4	-1.0	-0.7	-0.4	0.0	0.1	0.0	-0.1	-0.4	-0.4	-0.5	-0.6	-0.4	-0.3	-0.3	-0.3	-0.3	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.2	-0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.3	-1.0	-1.1

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



0.0	0.1	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	0.0	-0.2	-0.1	0.1	-0.5	-0.5	-0.1	-0.1	-0.1	-0.2	-0.2	-0.3	-0.2	-0.3	-0.4	-0.2	-0.1	-0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1
0.0	0.1	0.0	-0.1	0.0	-0.1	-0.2	-0.3	-0.4	-0.3	-0.2	-0.1	-1.0	-3.9	-3.8	-0.9	-0.0	0.1	0.2	0.1	0.1	0.2	0.2	-0.1	0.0	0.1	-0.2	0.0	0.0	0.2	0.4	0.4	0.1	0.2	0.0	0.0
0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	-1.6	-0.2	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.2	0.4	0.4	0.3	0.4	0.2	0.2	0.2
0.3	0.3	0.1	0.1	0.1	0.4	0.2	0.4	0.3	0.3	0.3	0.3	-0.2	0.3	0.2	0.2	0.2	-0.1	0.0	0.0	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.5	0.5	0.9	0.6	0.6	0.2	0.1	0.3	0.3
0.3	0.3	0.4	0.3	0.2	0.0	0.2	0.2	0.2	0.0	0.1	0.1	0.3	0.2	0.2	0.2	0.2	0.1	0.0	0.1	0.3	0.0	0.1	0.0	0.2	-0.1	0.3	1.0	1.1	0.9	0.4	0.3	0.1	0.3	0.4	0.3
0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.2	0.1	0.0	0.0	0.2	0.2	0.0	0.1	0.2	0.2	0.3	0.1	0.1	0.0	0.0	0.0	0.3	0.1	-0.7	-0.7	0.0	1.0	0.4	0.0	0.0	0.1	0.0	0.1	0.3
0.2	0.1	0.2	0.1	0.1	0.1	0.0	-0.2	-0.1	-0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.1	0.3	0.5	0.8	0.4	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.4	0.1	0.0	0.1	0.0	0.1	0.0	0.2
0.0	0.1	0.1	0.1	0.1	0.1	0.0	-0.1	-0.1	-0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	-0.1	0.1	0.3	0.6	0.7	0.2	0.0	0.1	0.0	-0.1	-0.2	0.0	0.1	-0.2	-0.1	0.0	0.1	0.1	0.1
-0.3	-0.2	-0.1	-0.2	0.0	0.0	0.1	0.1	0.1	0.0	-0.5	-0.1	-0.2	0.0	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	0.0	0.4	0.2	0.0	0.0	-0.3	-0.3	-0.4	-0.3	-0.3	-0.2	-0.2	-0.1	-0.2	-0.3	-0.2
-0.2	-0.1	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	-0.7	-0.8	-0.9	-0.5	0.1	0.1	0.2	0.2	0.1	-0.2	-0.5	-0.1	0.0	0.0	-0.2	-0.2	-0.1	-0.2	-0.2	0.0	-0.0	-0.4	-0.4	-0.3	-0.3	-0.4
0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	-0.2	-0.9	-0.6	0.1	0.1	0.1	0.1	0.2	0.1	-0.4	0.1	-0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	-0.2
0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.5	-0.3	-0.2	0.0	0.0	0.1	0.1	0.3	0.7	0.7	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.8	0.3	0.0	0.2	0.0	0.1	0.1
0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.0	0.3	0.2	0.1	0.1	0.1	0.2	0.3	0.4	0.2	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3	0.1	0.5	0.2	0.2	0.1
0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.3	0.2	0.4	0.3	0.3	0.2	0.3	0.2	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.2	0.1
0.2	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.1	0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.0	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	0.1	0.0	-0.1	0.0	0.0	0.0	-0.4	-0.2	0.0	-0.2	-0.4	-0.5	-0.2	-0.2	-0.2	-0.2	-0.1	0.0	0.0
-0.2	-0.2	-0.4	-0.3	-0.5	-0.8	-0.6	-0.5	-0.6	-0.5	-0.7	-0.8	-0.2	-0.2	-0.3	-0.6	-1.4	-2.8	-3.8	-4.2	-4.0	-3.9	-4.3	-3.9	-2.4	-2.9	-3.9	-5.4	-5.2	-4.6	-4.1	-3.2	-2.6	-2.2	-0.7	-0.3
-1.3	-1.2	-1.1	-0.8	-0.6	-1.1	-1.3	-1.6	-1.7	-1.2	-1.1	-1.3	-1.3	-1.3	-1.6	-1.9	-2.6	-3.3	-3.8	-4.2	-4.2	-4.6	-5.2	-5.5	-5.8	-6.0	-5.9	-5.5	-5.1	-4.5	-4.4	-4.2	-3.7	-2.5	-1.8	-1.5

Figure 46. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0
0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2
0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.5
0.3	0.3	0.3	0.2	0.1	0.0	0.1	0.2	0.3	0.3	0.3	0.2	-0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.4	0.4	0.4	0.3	0.5
0.4	0.3	0.2	0.2	0.0	-0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.4	0.4	0.4	0.5	0.4	0.4	0.3	0.4
0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.1	0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.1	0.0
-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.1	-0.1	0.0	-0.2	0.0	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.1	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.3	-0.1	-0.3
-0.2	-0.2	-0.2	-0.2	-0.3	-0.2	-0.3	-0.2	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.2	-0.3
-0.2	-0.3	-0.2	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.2	-0.3	-0.3	-0.3	-0.2	-0.3
-0.1	-0.2	-0.2	-0.3	-0.2	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.2	-0.2	-0.2	0.0	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3	-0.2	-0.3	-0.2
-0.2	-0.2	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	0.0	-0.2	-0.1	-0.2	-0.3	-0.2	-0.3	-0.2	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3	-0.2	-0.2	-0.3	0.0
-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.2	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	-0.2	0.0
0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.1	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.3
0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3
0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.4
0.5	0.5	0.5	0.6	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.5
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

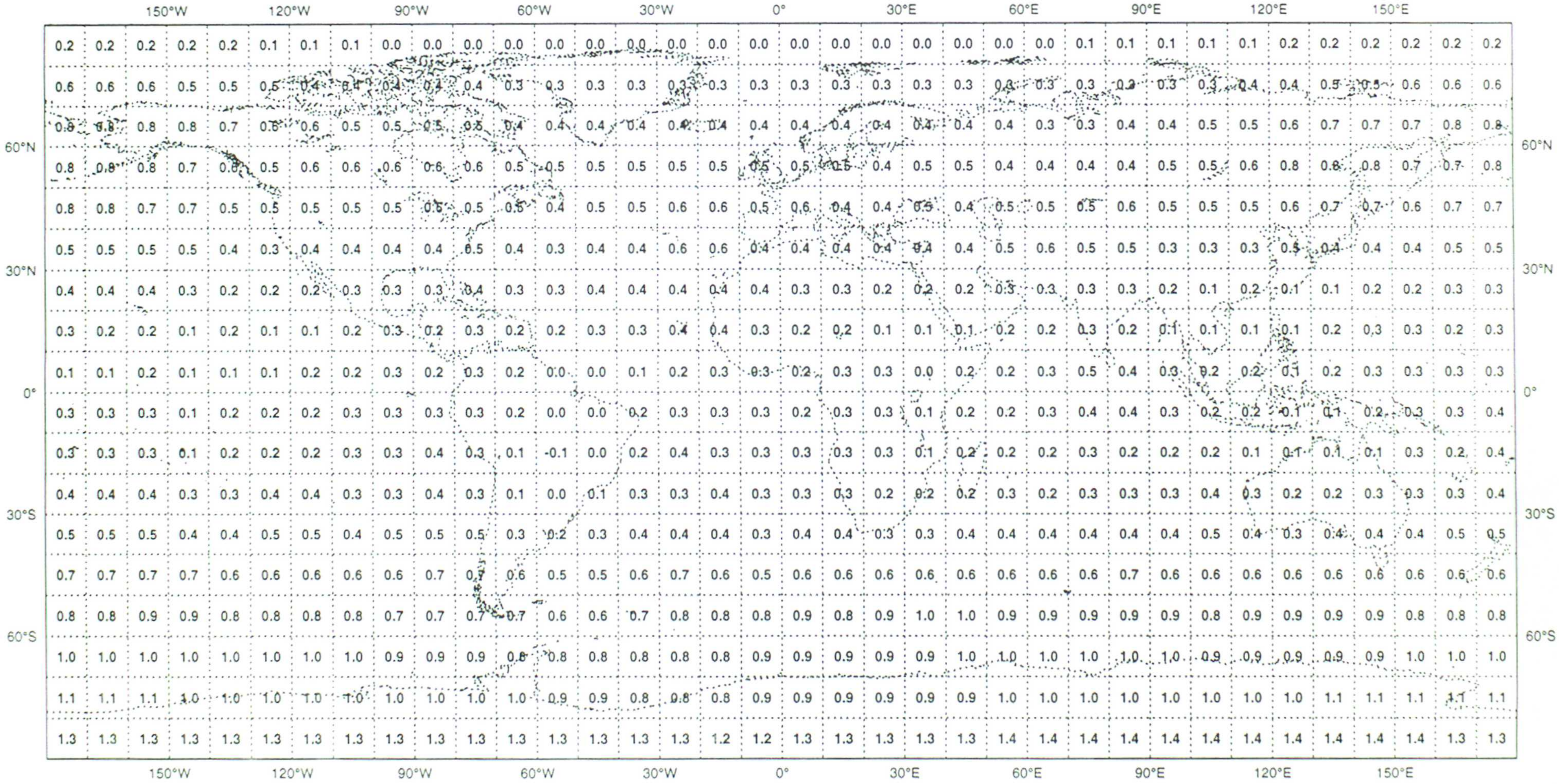
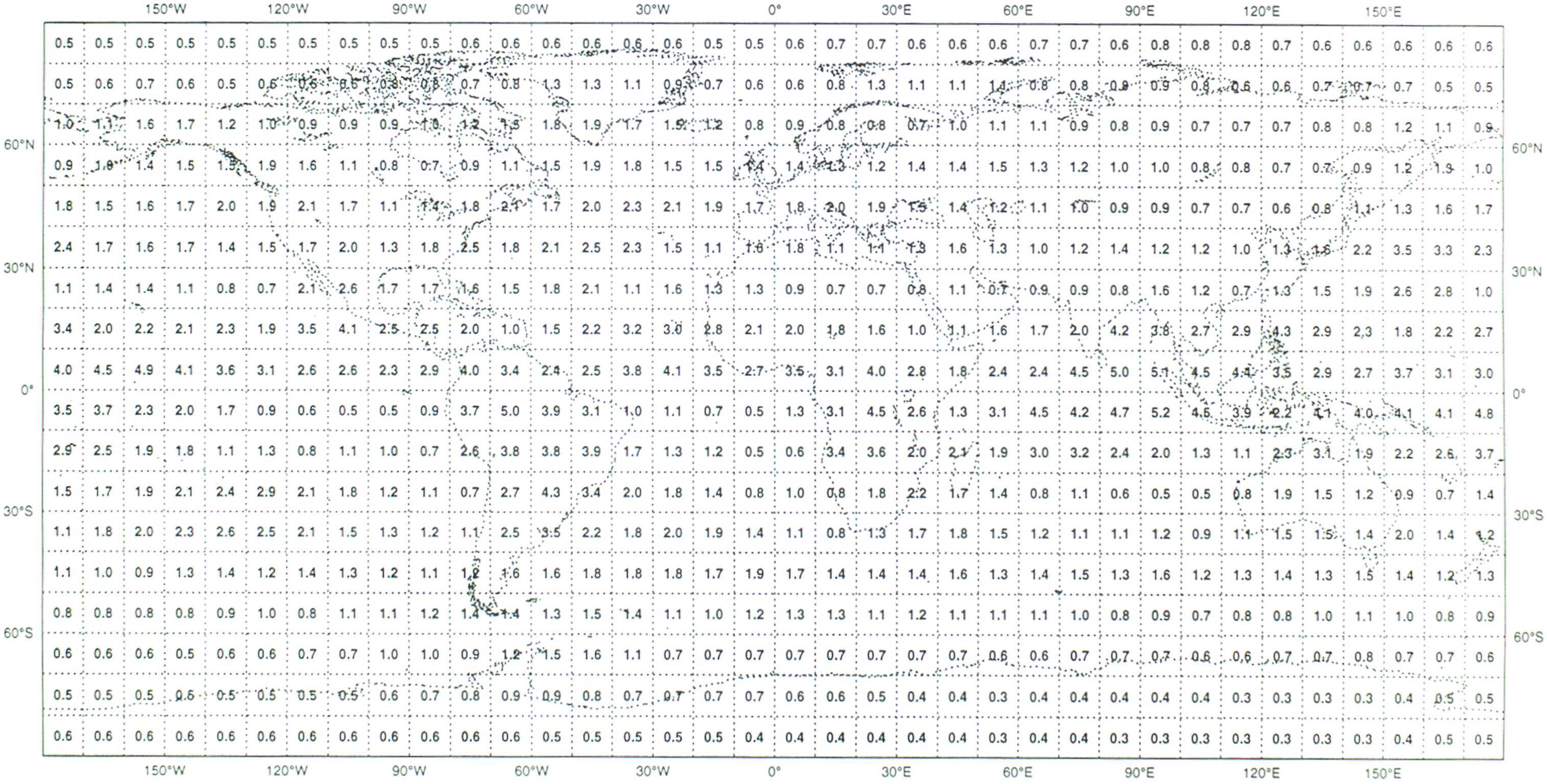
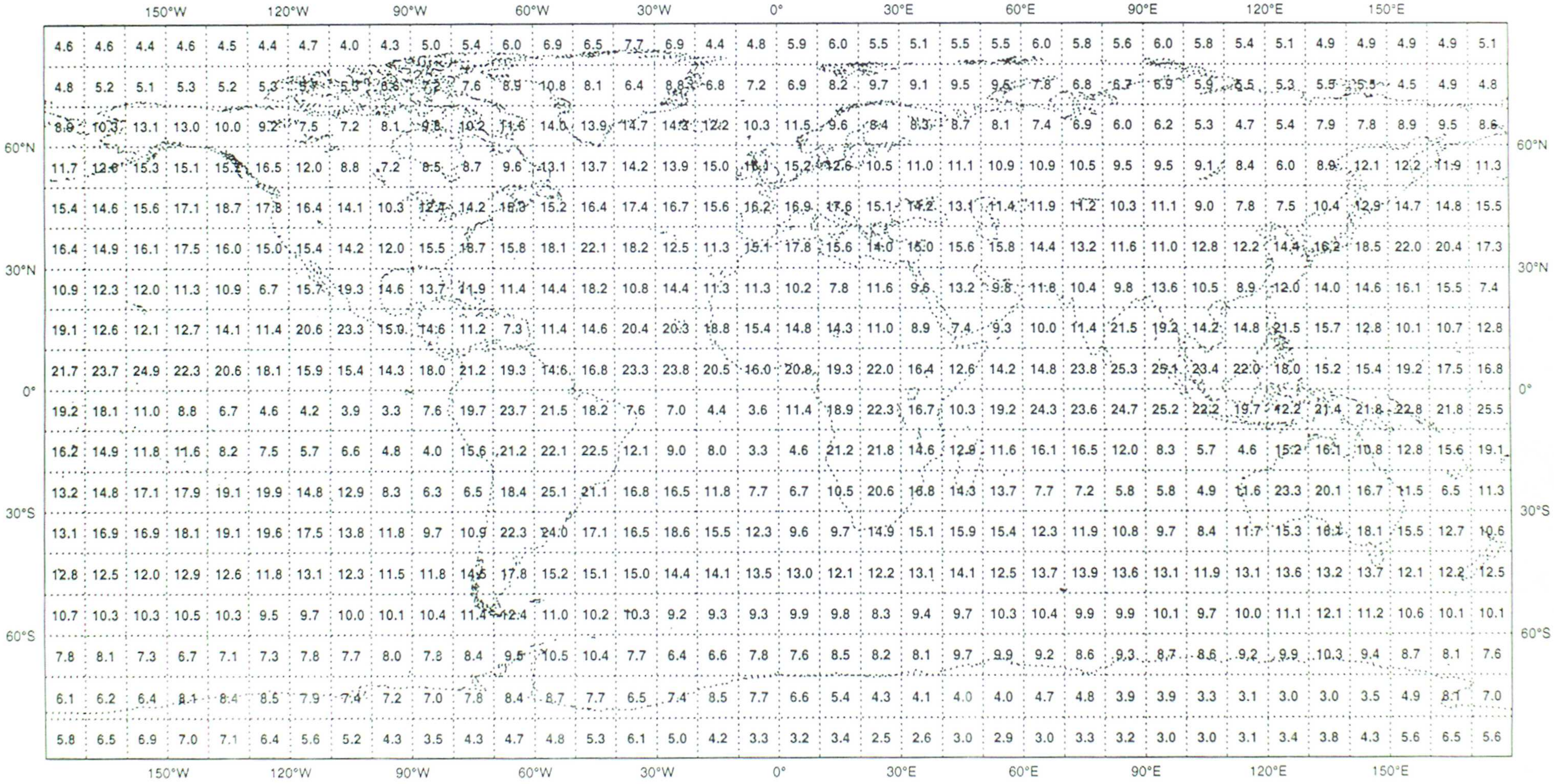

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0.2 0.2 0.2 0.2 0.2 0.1 0.1 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.1 0.1 0.1 0.1 0.1 0.2 0.2 0.2 0.2 0.2 0.2
0.6 0.6 0.6 0.5 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.4 0.5 0.5 0.6 0.6 0.6
0.9 0.8 0.8 0.8 0.7 0.6 0.6 0.5 0.5 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.3 0.3 0.4 0.4 0.5 0.5 0.6 0.7 0.7 0.7 0.8 0.8
0.8 0.8 0.8 0.7 0.8 0.5 0.6 0.6 0.6 0.6 0.6 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.5 0.5 0.4 0.4 0.4 0.4 0.5 0.5 0.6 0.8 0.8 0.8 0.7 0.7 0.8
0.8 0.8 0.7 0.7 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.5 0.5 0.6 0.6 0.5 0.6 0.4 0.4 0.5 0.4 0.5 0.5 0.5 0.6 0.5 0.5 0.5 0.6 0.7 0.7 0.6 0.7 0.7
0.5 0.5 0.5 0.5 0.4 0.3 0.4 0.4 0.4 0.4 0.5 0.4 0.3 0.4 0.4 0.6 0.6 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.6 0.5 0.5 0.3 0.3 0.3 0.5 0.4 0.4 0.4 0.5 0.5
0.4 0.4 0.4 0.3 0.2 0.2 0.2 0.3 0.3 0.3 0.4 0.3 0.3 0.4 0.4 0.4 0.4 0.4 0.3 0.3 0.2 0.2 0.2 0.3 0.3 0.3 0.3 0.2 0.1 0.2 0.1 0.1 0.2 0.2 0.3 0.3
0.3 0.2 0.2 0.1 0.2 0.1 0.1 0.2 0.3 0.2 0.3 0.2 0.2 0.3 0.3 0.4 0.4 0.3 0.2 0.2 0.1 0.1 0.1 0.2 0.2 0.3 0.2 0.1 0.1 0.1 0.1 0.2 0.3 0.3 0.2 0.3
0.1 0.1 0.2 0.1 0.1 0.1 0.2 0.2 0.3 0.2 0.3 0.2 0.0 0.0 0.1 0.2 0.3 0.3 0.2 0.3 0.3 0.0 0.2 0.2 0.3 0.5 0.4 0.3 0.2 0.2 0.1 0.2 0.3 0.3 0.3 0.3
0.3 0.3 0.3 0.1 0.2 0.2 0.2 0.3 0.3 0.3 0.3 0.2 0.0 0.0 0.2 0.3 0.3 0.3 0.2 0.3 0.3 0.1 0.2 0.2 0.3 0.4 0.4 0.3 0.2 0.2 0.1 0.1 0.2 0.3 0.3 0.4
0.3 0.3 0.3 0.1 0.2 0.2 0.2 0.3 0.3 0.4 0.3 0.1 -0.1 0.0 0.2 0.4 0.3 0.3 0.3 0.3 0.3 0.1 0.2 0.2 0.2 0.3 0.2 0.2 0.2 0.1 0.1 0.1 0.1 0.3 0.2 0.4
0.4 0.4 0.4 0.3 0.3 0.4 0.4 0.3 0.3 0.4 0.3 0.1 0.0 0.1 0.3 0.3 0.4 0.3 0.3 0.3 0.2 0.2 0.2 0.3 0.2 0.3 0.3 0.3 0.4 0.3 0.2 0.2 0.3 0.3 0.3 0.4
0.5 0.5 0.5 0.4 0.4 0.5 0.5 0.4 0.5 0.5 0.5 0.3 0.2 0.3 0.4 0.4 0.4 0.3 0.4 0.4 0.3 0.3 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.4 0.3 0.4 0.4 0.4 0.5 0.5
0.7 0.7 0.7 0.7 0.6 0.6 0.6 0.6 0.6 0.7 0.7 0.6 0.5 0.6 0.7 0.6 0.5 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.7 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6
0.8 0.8 0.9 0.9 0.8 0.8 0.8 0.8 0.7 0.7 0.7 0.7 0.6 0.6 0.7 0.8 0.8 0.8 0.9 0.8 0.9 1.0 1.0 0.9 0.9 0.9 0.9 0.9 0.8 0.9 0.9 0.9 0.9 0.8 0.8 0.8
1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 0.9 0.9 0.9 0.8 0.8 0.8 0.8 0.8 0.8 0.9 0.9 0.9 0.9 0.9 1.0 1.0 1.0 1.0 1.0 1.0 0.9 0.9 0.9 0.9 0.9 1.0 1.0 1.0
1.1 1.1 1.1 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 0.9 0.9 0.8 0.8 0.8 0.9 0.9 0.9 0.9 0.9 0.9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.1 1.1 1.1 1.1 1.1
1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.2 1.2 1.3 1.3 1.3 1.3 1.3 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.3 1.3

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: HIRS4 (400 hPa)
NOAA16, using all observations



0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.7	0.7	0.6	0.6	0.6	0.7	0.7	0.6	0.8	0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.6
0.5	0.6	0.7	0.6	0.5	0.6	0.6	0.6	0.8	0.8	0.7	0.8	1.3	1.3	1.1	0.9	0.7	0.6	0.6	0.8	1.3	1.1	1.1	1.4	0.8	0.8	0.9	0.9	0.8	0.6	0.6	0.7	0.7	0.7	0.5	0.5
1.0	1.1	1.6	1.7	1.2	1.0	0.9	0.9	0.9	1.0	1.2	1.5	1.8	1.9	1.7	1.5	1.2	0.8	0.9	0.8	0.8	0.7	1.0	1.1	1.1	0.9	0.8	0.9	0.7	0.7	0.7	0.8	0.8	1.2	1.1	0.9
0.9	1.0	1.4	1.5	1.5	1.9	1.6	1.1	0.8	0.7	0.9	1.1	1.5	1.9	1.8	1.5	1.5	1.4	1.4	1.3	1.2	1.4	1.4	1.5	1.3	1.2	1.0	1.0	0.8	0.8	0.7	0.7	0.9	1.2	1.3	1.0
1.8	1.5	1.6	1.7	2.0	1.9	2.1	1.7	1.1	1.4	1.8	2.1	1.7	2.0	2.3	2.1	1.9	1.7	1.8	2.0	1.9	1.5	1.4	1.2	1.1	1.0	0.9	0.9	0.7	0.7	0.6	0.8	1.1	1.3	1.6	1.7
2.4	1.7	1.6	1.7	1.4	1.5	1.7	2.0	1.3	1.8	2.5	1.8	2.1	2.5	2.3	1.5	1.1	1.6	1.8	1.1	1.1	1.3	1.6	1.3	1.0	1.2	1.4	1.2	1.2	1.0	1.3	1.6	2.2	3.5	3.3	2.3
1.1	1.4	1.4	1.1	0.8	0.7	2.1	2.6	1.7	1.7	1.6	1.5	1.8	2.1	1.1	1.6	1.3	1.3	0.9	0.7	0.7	0.8	1.1	0.7	0.9	0.9	0.8	1.6	1.2	0.7	1.3	1.5	1.9	2.6	2.8	1.0
3.4	2.0	2.2	2.1	2.3	1.9	3.5	4.1	2.5	2.5	2.0	1.0	1.5	2.2	3.2	3.0	2.8	2.1	2.0	1.8	1.6	1.0	1.1	1.6	1.7	2.0	4.2	3.8	2.7	2.9	4.3	2.9	2.3	1.8	2.2	2.7
4.0	4.5	4.9	4.1	3.6	3.1	2.6	2.6	2.3	2.9	4.0	3.4	2.4	2.5	3.8	4.1	3.5	2.7	3.5	3.1	4.0	2.8	1.8	2.4	2.4	4.5	5.0	5.1	4.5	4.4	3.5	2.9	2.7	3.7	3.1	3.0
3.5	3.7	2.3	2.0	1.7	0.9	0.6	0.5	0.5	0.9	3.7	5.0	3.9	3.1	1.0	1.1	0.7	0.5	1.3	3.1	4.5	2.6	1.3	3.1	4.5	4.2	4.7	5.2	4.6	3.9	2.2	4.1	4.0	4.1	4.1	4.8
2.9	2.5	1.9	1.8	1.1	1.3	0.8	1.1	1.0	0.7	2.6	3.8	3.8	3.9	1.7	1.3	1.2	0.5	0.6	3.4	3.6	2.0	2.1	1.9	3.0	3.2	2.4	2.0	1.3	1.1	2.3	3.1	1.9	2.2	2.6	3.7
1.5	1.7	1.9	2.1	2.4	2.9	2.1	1.8	1.2	1.1	0.7	2.7	4.3	3.4	2.0	1.8	1.4	0.8	1.0	0.8	1.8	2.2	1.7	1.4	0.8	1.1	0.6	0.5	0.5	0.8	1.9	1.5	1.2	0.9	0.7	1.4
1.1	1.8	2.0	2.3	2.6	2.5	2.1	1.5	1.3	1.2	1.1	2.5	3.5	2.2	1.8	2.0	1.9	1.4	1.1	0.8	1.3	1.7	1.8	1.5	1.2	1.1	1.1	1.2	0.9	1.1	1.5	1.5	1.4	2.0	1.4	1.2
1.1	1.0	0.9	1.3	1.4	1.2	1.4	1.3	1.2	1.1	1.2	1.6	1.6	1.8	1.8	1.8	1.7	1.9	1.7	1.4	1.4	1.4	1.6	1.3	1.4	1.5	1.3	1.6	1.2	1.3	1.4	1.3	1.5	1.4	1.2	1.3
0.8	0.8	0.8	0.8	0.9	1.0	0.8	1.1	1.1	1.2	1.4	1.4	1.3	1.5	1.4	1.1	1.0	1.2	1.3	1.3	1.1	1.2	1.1	1.1	1.1	1.0	0.8	0.9	0.7	0.8	0.8	1.0	1.1	1.0	0.8	0.9
0.6	0.6	0.6	0.5	0.6	0.6	0.7	0.7	1.0	1.0	0.9	1.2	1.5	1.6	1.1	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.8	0.7	0.7	0.6
0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.7	0.8	0.9	0.9	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.5	0.5
0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations



4.6	4.6	4.4	4.6	4.5	4.4	4.7	4.0	4.3	5.0	5.4	6.0	6.9	6.5	7.7	6.9	4.4	4.8	5.9	6.0	5.5	5.1	5.5	5.5	6.0	5.8	5.6	6.0	5.8	5.4	5.1	4.9	4.9	4.9	4.9	5.1
4.8	5.2	5.1	5.3	5.2	5.3	5.7	5.3	8.8	7.2	7.6	8.9	10.8	8.1	6.4	8.8	6.8	7.2	6.9	8.2	9.7	9.1	9.5	9.5	7.8	6.8	6.7	6.9	5.9	5.5	5.3	5.5	5.5	4.5	4.9	4.8
8.9	10.3	13.1	13.0	10.0	9.2	7.5	7.2	8.1	9.8	10.2	11.6	14.0	13.9	14.7	14.3	12.2	10.3	11.5	9.6	8.4	8.3	8.7	8.1	7.4	6.9	6.0	6.2	5.3	4.7	5.4	7.9	7.8	8.9	9.5	8.6
11.7	12.6	15.3	15.1	15.2	16.5	12.0	8.8	7.2	8.5	8.7	9.6	13.1	13.7	14.2	13.9	15.0	16.1	15.2	12.6	10.5	11.0	11.1	10.9	10.9	10.5	9.5	9.5	9.1	8.4	6.0	8.9	12.1	12.2	11.9	11.3
15.4	14.6	15.6	17.1	18.7	17.8	16.4	14.1	10.3	12.4	14.2	18.3	15.2	16.4	17.4	16.7	15.6	16.2	16.9	17.6	15.1	14.2	13.1	11.4	11.9	11.2	10.3	11.1	9.0	7.8	7.5	10.4	12.9	14.7	14.8	15.5
16.4	14.9	16.1	17.5	16.0	15.0	15.4	14.2	12.0	15.5	18.7	15.8	18.1	22.1	18.2	12.5	11.3	15.1	17.8	15.6	14.0	15.0	15.6	15.8	14.4	13.2	11.6	11.0	12.8	12.2	14.4	16.2	18.5	22.0	20.4	17.3
10.9	12.3	12.0	11.3	10.9	6.7	15.7	19.3	14.6	13.7	11.9	11.4	14.4	18.2	10.8	14.4	11.3	11.3	10.2	7.8	11.6	9.6	13.2	9.8	11.8	10.4	9.8	13.6	10.5	8.9	12.0	14.0	14.6	16.1	15.5	7.4
19.1	12.6	12.1	12.7	14.1	11.4	20.6	23.3	15.0	14.6	11.2	7.3	11.4	14.6	20.4	20.3	18.8	15.4	14.8	14.3	11.0	8.9	7.4	9.3	10.0	11.4	21.5	19.2	14.2	14.8	21.5	15.7	12.8	10.1	10.7	12.8
21.7	23.7	24.9	22.3	20.6	18.1	15.9	15.4	14.3	18.0	21.2	19.3	14.6	16.8	23.3	23.8	20.5	16.0	20.8	19.3	22.0	16.4	12.6	14.2	14.8	23.8	25.3	25.1	23.4	22.0	18.0	15.2	15.4	19.2	17.5	16.8
19.2	18.1	11.0	8.8	6.7	4.6	4.2	3.9	3.3	7.6	19.7	23.7	21.5	18.2	7.6	7.0	4.4	3.6	11.4	18.9	22.3	16.7	10.3	19.2	24.3	23.6	24.7	25.2	22.2	19.7	12.2	21.4	21.8	22.8	21.8	25.5
16.2	14.9	11.8	11.6	8.2	7.5	5.7	6.6	4.8	4.0	15.6	21.2	22.1	22.5	12.1	9.0	8.0	3.3	4.6	21.2	21.8	14.6	12.9	11.6	16.1	16.5	12.0	8.3	5.7	4.6	15.2	16.1	10.8	12.8	15.6	19.1
13.2	14.8	17.1	17.9	19.1	19.9	14.8	12.9	8.3	6.3	6.5	18.4	25.1	21.1	16.8	16.5	11.8	7.7	6.7	10.5	20.6	16.8	14.3	13.7	7.7	7.2	5.8	5.8	4.9	11.6	23.3	20.1	16.7	11.5	6.5	11.3
13.1	16.9	16.9	18.1	19.1	19.6	17.5	13.8	11.8	9.7	10.9	22.3	24.0	17.1	16.5	18.6	15.5	12.3	9.6	9.7	14.9	15.1	15.9	15.4	12.3	11.9	10.8	9.7	8.4	11.7	15.3	16.1	18.1	15.5	12.7	10.6
12.8	12.5	12.0	12.9	12.6	11.8	13.1	12.3	11.5	11.8	14.5	17.8	15.2	15.1	15.0	14.4	14.1	13.5	13.0	12.1	12.2	13.1	14.1	12.5	13.7	13.9	13.6	13.1	11.9	13.1	13.6	13.2	13.7	12.1	12.2	12.5
10.7	10.3	10.3	10.5	10.3	9.5	9.7	10.0	10.1	10.4	11.4	12.4	11.0	10.2	10.3	9.2	9.3	9.3	9.9	9.8	8.3	9.4	9.7	10.3	10.4	9.9	9.9	10.1	9.7	10.0	11.1	12.1	11.2	10.6	10.1	10.1
7.8	8.1	7.3	6.7	7.1	7.3	7.8	7.7	8.0	7.8	8.4	9.5	10.5	10.4	7.7	6.4	6.6	7.8	7.6	8.5	8.2	8.1	9.7	9.9	9.2	8.6	9.3	8.7	8.6	9.2	9.9	10.3	9.4	8.7	8.1	7.6
6.1	6.2	6.4	8.1	8.4	8.5	7.9	7.4	7.2	7.0	7.8	8.4	8.7	7.7	6.5	7.4	8.5	7.7	6.6	5.4	4.3	4.1	4.0	4.0	4.7	4.8	3.9	3.9	3.3	3.1	3.0	3.0	3.5	4.9	8.1	7.0
5.8	6.5	6.9	7.0	7.1	6.4	5.6	5.2	4.3	3.5	4.3	4.7	4.8	5.3	6.1	5.0	4.2	3.3	3.2	3.4	2.5	2.6	3.0	2.9	3.0	3.3	3.2	3.0	3.0	3.1	3.4	3.8	4.3	5.6	6.5	5.6

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

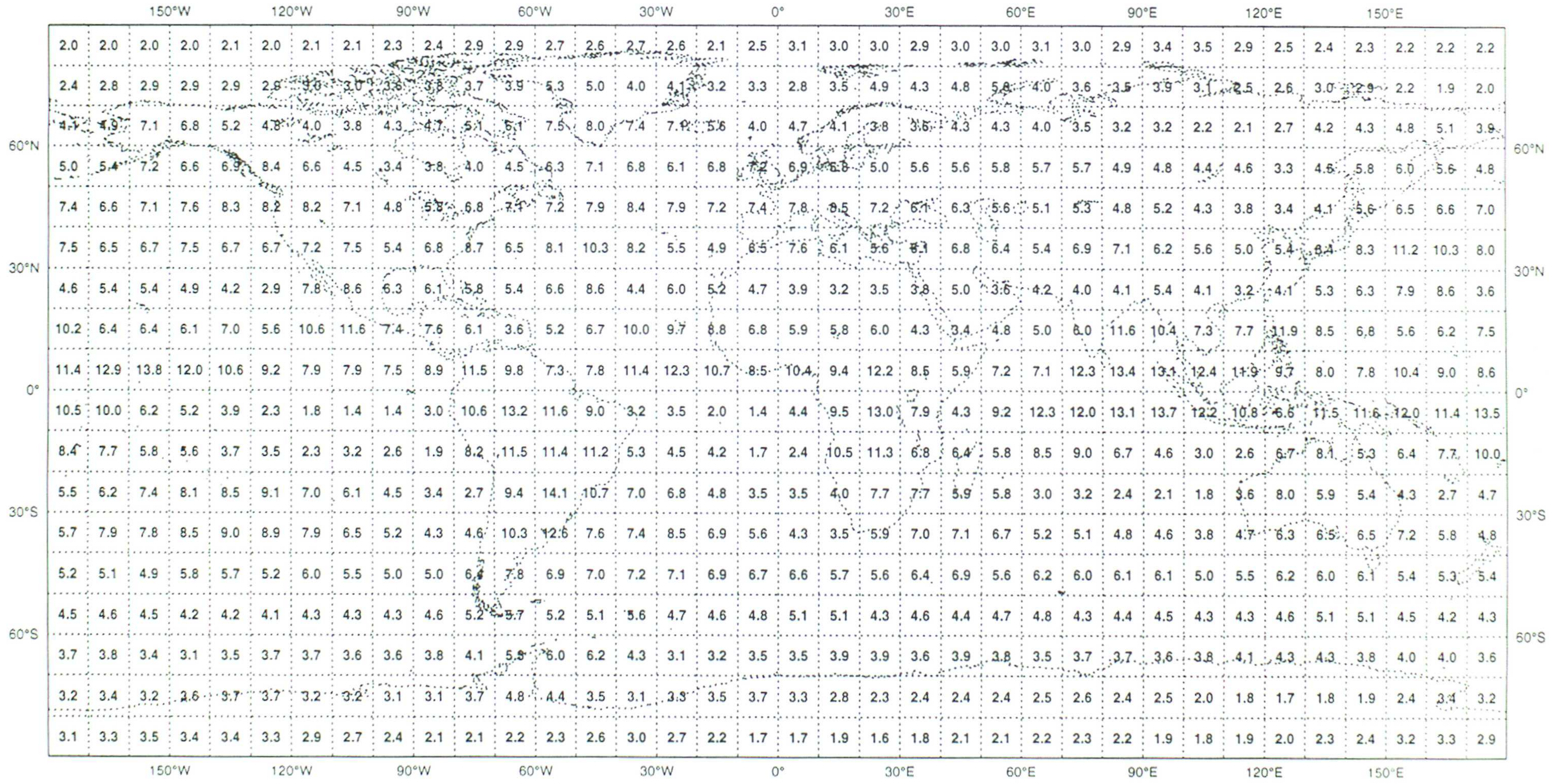
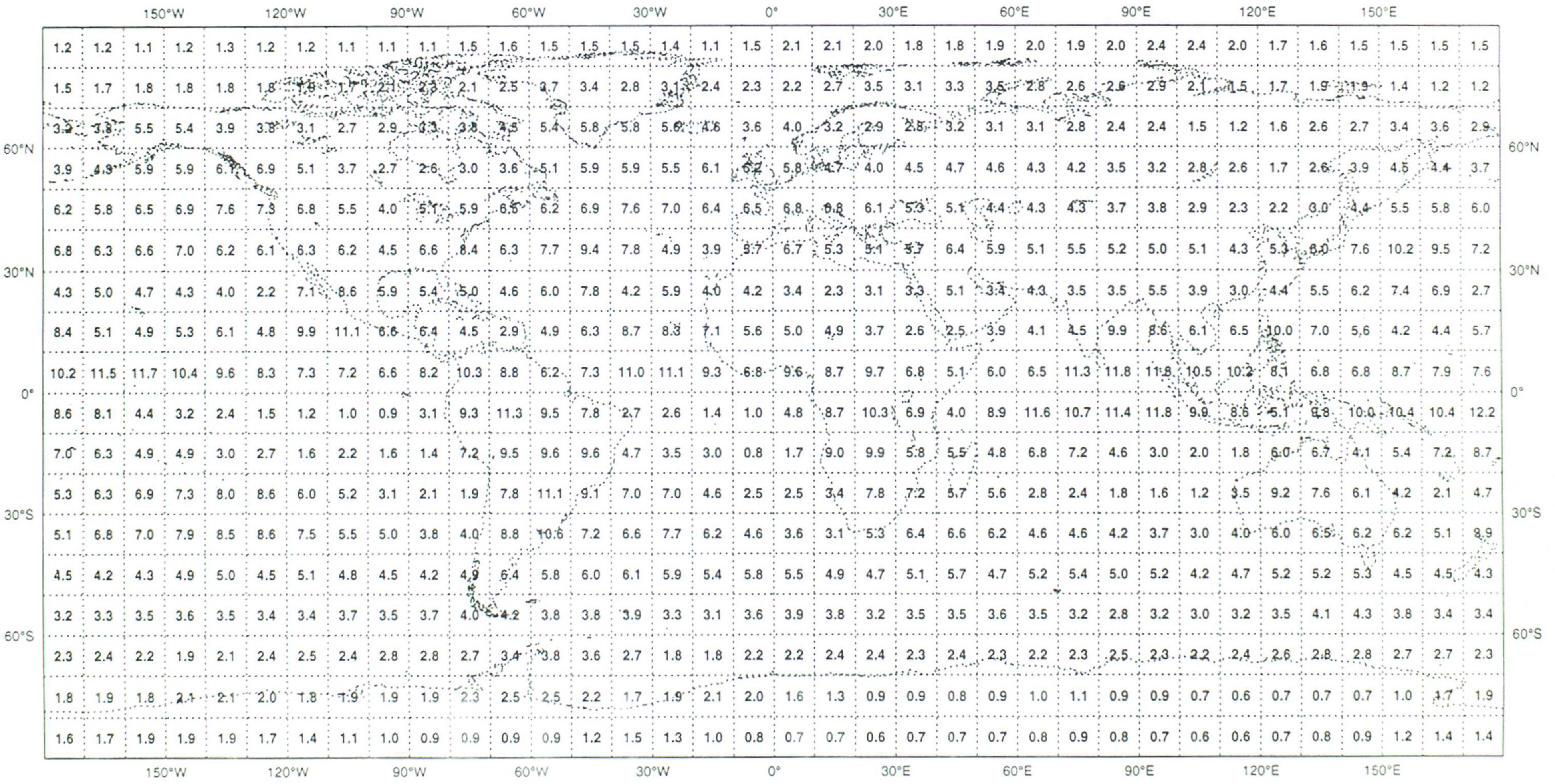
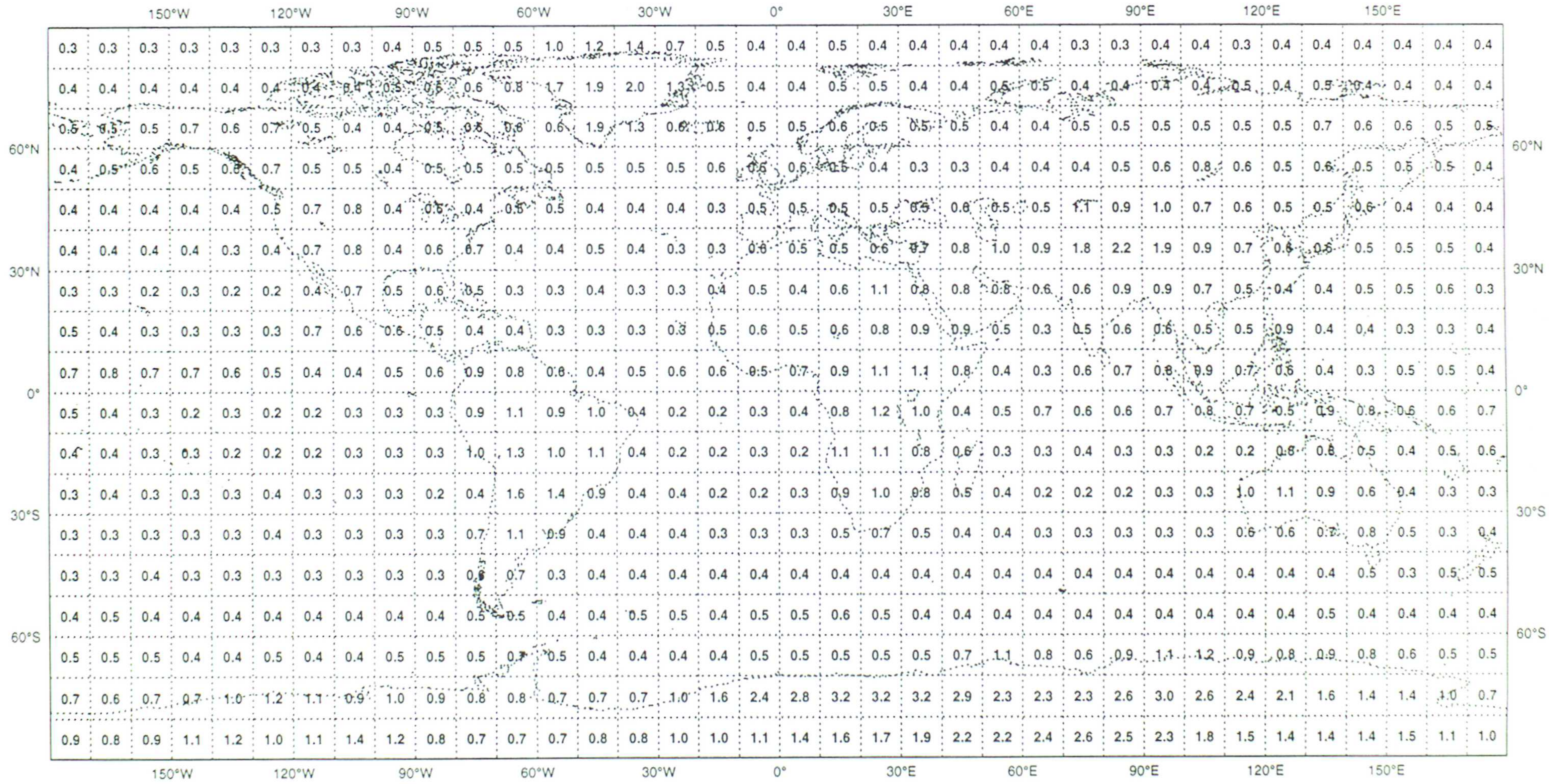

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
2.0 2.0 2.0 2.0 2.1 2.0 2.1 2.1 2.3 2.4 2.9 2.9 2.7 2.6 2.7 2.6 2.1 2.5 3.1 3.0 3.0 2.9 3.0 3.0 3.1 3.0 2.9 3.4 3.5 2.9 2.5 2.4 2.3 2.2 2.2 2.2
2.4 2.8 2.9 2.9 2.9 2.8 3.0 3.0 3.6 3.8 3.7 3.9 5.3 5.0 4.0 4.1 3.2 3.3 2.8 3.5 4.9 4.3 4.8 5.8 4.0 3.6 3.5 3.9 3.1 2.5 2.6 3.0 2.9 2.2 1.9 2.0
4.1 4.9 7.1 6.8 5.2 4.8 4.0 3.8 4.3 4.7 5.1 6.1 7.5 8.0 7.4 7.1 5.6 4.0 4.7 4.1 3.8 3.5 4.3 4.3 4.0 3.5 3.2 3.2 2.2 2.1 2.7 4.2 4.3 4.8 5.1 3.9
5.0 5.4 7.2 6.6 6.9 8.4 6.6 4.5 3.4 3.8 4.0 4.5 6.3 7.1 6.8 6.1 6.8 7.2 6.9 6.8 5.0 5.6 5.6 5.8 5.7 5.7 4.9 4.8 4.4 4.6 3.3 4.6 5.8 6.0 5.6 4.8
7.4 6.6 7.1 7.6 8.3 8.2 8.2 7.1 4.8 5.8 6.8 7.1 7.2 7.9 8.4 7.9 7.2 7.4 7.8 9.5 7.2 6.1 6.3 5.6 5.1 5.3 4.8 5.2 4.3 3.8 3.4 4.1 5.6 6.5 6.6 7.0
7.5 6.5 6.7 7.5 6.7 6.7 7.2 7.5 5.4 6.8 8.7 6.5 8.1 10.3 8.2 5.5 4.9 6.5 7.6 6.1 5.6 8.1 6.8 6.4 5.4 6.9 7.1 6.2 5.6 5.0 5.4 8.4 8.3 11.2 10.3 8.0
4.6 5.4 5.4 4.9 4.2 2.9 7.8 8.6 6.3 6.1 5.8 5.4 6.6 8.6 4.4 6.0 5.2 4.7 3.9 3.2 3.5 3.8 5.0 3.6 4.2 4.0 4.1 5.4 4.1 3.2 4.1 5.3 6.3 7.9 8.6 3.6
10.2 6.4 6.4 6.1 7.0 5.6 10.6 11.6 7.4 7.6 6.1 3.6 5.2 6.7 10.0 9.7 8.8 6.8 5.9 5.8 6.0 4.3 3.4 4.8 5.0 6.0 11.6 10.4 7.3 7.7 11.9 8.5 6.8 5.6 6.2 7.5
11.4 12.9 13.8 12.0 10.6 9.2 7.9 7.9 7.5 8.9 11.5 9.8 7.3 7.8 11.4 12.3 10.7 8.5 10.4 9.4 12.2 8.5 5.9 7.2 7.1 12.3 13.4 13.1 12.4 11.9 9.7 8.0 7.8 10.4 9.0 8.6
10.5 10.0 6.2 5.2 3.9 2.3 1.8 1.4 1.4 3.0 10.6 13.2 11.6 9.0 3.2 3.5 2.0 1.4 4.4 9.5 13.0 7.9 4.3 9.2 12.3 12.0 13.1 13.7 12.2 10.8 6.6 11.5 11.6 12.0 11.4 13.5
8.4 7.7 5.8 5.6 3.7 3.5 2.3 3.2 2.6 1.9 8.2 11.5 11.4 11.2 5.3 4.5 4.2 1.7 2.4 10.5 11.3 6.8 6.4 5.8 8.5 9.0 6.7 4.6 3.0 2.6 6.7 8.1 5.3 6.4 7.7 10.0
5.5 6.2 7.4 8.1 8.5 9.1 7.0 6.1 4.5 3.4 2.7 9.4 14.1 10.7 7.0 6.8 4.8 3.5 3.5 4.0 7.7 7.7 5.9 5.8 3.0 3.2 2.4 2.1 1.8 3.6 8.0 5.9 5.4 4.3 2.7 4.7
5.7 7.9 7.8 8.5 9.0 8.9 7.9 6.5 5.2 4.3 4.6 10.3 12.6 7.6 7.4 8.5 6.9 5.6 4.3 3.5 5.9 7.0 7.1 6.7 5.2 5.1 4.8 4.6 3.8 4.7 6.3 6.5 6.5 7.2 5.8 4.8
5.2 5.1 4.9 5.8 5.7 5.2 6.0 5.5 5.0 5.0 6.4 7.8 6.9 7.0 7.2 7.1 6.9 6.7 6.6 5.7 5.6 6.4 6.9 5.6 6.2 6.0 6.1 6.1 5.0 5.5 6.2 6.0 6.1 5.4 5.3 5.4
4.5 4.6 4.5 4.2 4.2 4.1 4.3 4.3 4.3 4.6 5.2 5.7 5.2 5.1 5.6 4.7 4.6 4.8 5.1 5.1 4.3 4.6 4.4 4.7 4.8 4.3 4.4 4.5 4.3 4.3 4.6 5.1 5.1 4.5 4.2 4.3
3.7 3.8 3.4 3.1 3.5 3.7 3.7 3.6 3.6 3.8 4.1 5.8 6.0 6.2 4.3 3.1 3.2 3.5 3.5 3.9 3.9 3.6 3.9 3.8 3.5 3.7 3.7 3.6 3.8 4.1 4.3 4.3 3.8 4.0 4.0 3.6
3.2 3.4 3.2 3.6 3.7 3.7 3.2 3.2 3.1 3.1 3.7 4.8 4.4 3.5 3.1 3.3 3.5 3.7 3.3 2.8 2.3 2.4 2.4 2.4 2.4 2.5 2.6 2.4 2.5 2.0 1.8 1.7 1.8 1.9 2.4 3.4 3.2
3.1 3.3 3.5 3.4 3.4 3.3 2.9 2.7 2.4 2.1 2.1 2.2 2.3 2.6 3.0 2.7 2.2 1.7 1.7 1.9 1.6 1.8 2.1 2.1 2.2 2.3 2.2 1.9 1.8 1.9 2.0 2.3 2.4 3.2 3.3 2.9

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations



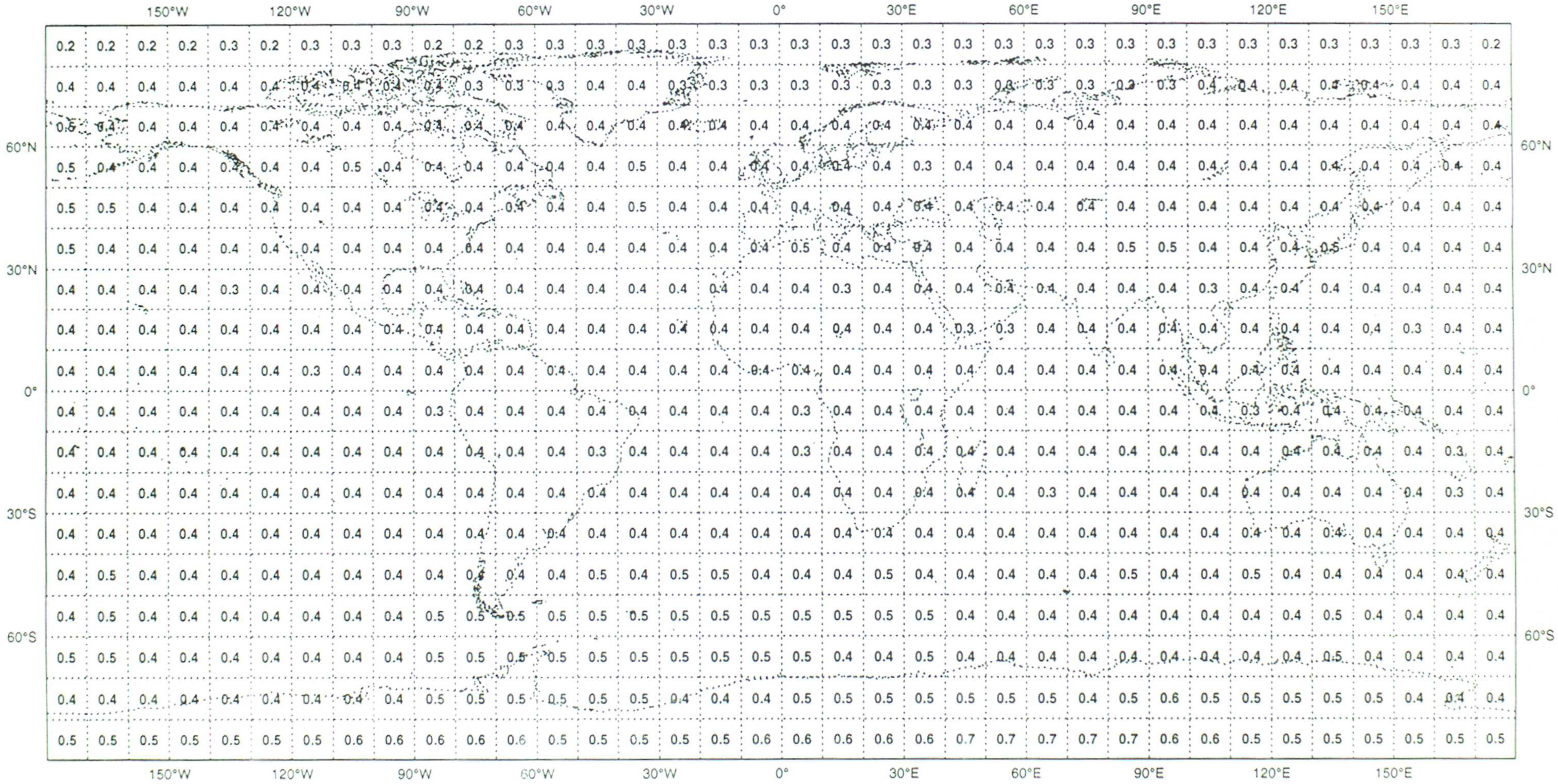
1.2	1.2	1.1	1.2	1.3	1.2	1.2	1.1	1.1	1.1	1.5	1.6	1.5	1.5	1.5	1.4	1.1	1.5	2.1	2.1	2.0	1.8	1.8	1.9	2.0	1.9	2.0	2.4	2.4	2.0	1.7	1.6	1.5	1.5	1.5	1.5
1.5	1.7	1.8	1.8	1.8	1.8	1.8	1.7	2.1	2.3	2.1	2.5	3.7	3.4	2.8	3.1	2.4	2.3	2.2	2.7	3.5	3.1	3.3	3.5	2.8	2.6	2.6	2.9	2.1	1.5	1.7	1.9	1.9	1.4	1.2	1.2
3.2	3.8	5.5	5.4	3.9	3.8	3.1	2.7	2.9	3.3	3.8	4.5	5.4	5.8	5.8	5.6	4.6	3.6	4.0	3.2	2.9	2.8	3.2	3.1	3.1	2.8	2.4	2.4	1.5	1.2	1.6	2.6	2.7	3.4	3.6	2.9
3.9	4.3	5.9	5.9	6.1	6.9	5.1	3.7	2.7	2.6	3.0	3.6	5.1	5.9	5.9	5.5	6.1	6.2	5.8	4.7	4.0	4.5	4.7	4.6	4.3	4.2	3.5	3.2	2.8	2.6	1.7	2.6	3.9	4.5	4.4	3.7
6.2	5.8	6.5	6.9	7.6	7.3	6.8	5.5	4.0	5.1	5.9	6.5	6.2	6.9	7.6	7.0	6.4	6.5	6.8	6.8	6.1	5.3	5.1	4.4	4.3	4.3	3.7	3.8	2.9	2.3	2.2	3.0	4.4	5.5	5.8	6.0
6.8	6.3	6.6	7.0	6.2	6.1	6.3	6.2	4.5	6.6	8.4	6.3	7.7	9.4	7.8	4.9	3.9	5.7	6.7	5.3	5.1	5.7	6.4	5.9	5.1	5.5	5.2	5.0	5.1	4.3	5.3	8.0	7.6	10.2	9.5	7.2
4.3	5.0	4.7	4.3	4.0	2.2	7.1	8.6	5.9	5.4	5.0	4.6	6.0	7.8	4.2	5.9	4.0	4.2	3.4	2.3	3.1	3.3	5.1	3.4	4.3	3.5	3.5	5.5	3.9	3.0	4.4	5.5	6.2	7.4	6.9	2.7
8.4	5.1	4.9	5.3	6.1	4.8	9.9	11.1	6.6	6.4	4.5	2.9	4.9	6.3	8.7	8.3	7.1	5.6	5.0	4.9	3.7	2.6	2.5	3.9	4.1	4.5	9.9	8.6	6.1	6.5	10.0	7.0	5.6	4.2	4.4	5.7
10.2	11.5	11.7	10.4	9.6	8.3	7.3	7.2	6.6	8.2	10.3	8.8	6.2	7.3	11.0	11.1	9.3	6.8	9.6	8.7	9.7	6.8	5.1	6.0	6.5	11.3	11.8	11.8	10.5	10.2	8.1	6.8	6.8	8.7	7.9	7.6
8.6	8.1	4.4	3.2	2.4	1.5	1.2	1.0	0.9	3.1	9.3	11.3	9.5	7.8	2.7	2.6	1.4	1.0	4.8	8.7	10.3	6.9	4.0	8.9	11.6	10.7	11.4	11.8	9.9	8.6	5.1	8.8	10.0	10.4	10.4	12.2
7.0	6.3	4.9	4.9	3.0	2.7	1.6	2.2	1.6	1.4	7.2	9.5	9.6	9.6	4.7	3.5	3.0	0.8	1.7	9.0	9.9	5.8	5.5	4.8	6.8	7.2	4.6	3.0	2.0	1.8	6.0	6.7	4.1	5.4	7.2	8.7
5.3	6.3	6.9	7.3	8.0	8.6	6.0	5.2	3.1	2.1	1.9	7.8	11.1	9.1	7.0	7.0	4.6	2.5	2.5	3.4	7.8	7.2	5.7	5.6	2.8	2.4	1.8	1.6	1.2	3.5	9.2	7.6	6.1	4.2	2.1	4.7
5.1	6.8	7.0	7.9	8.5	8.6	7.5	5.5	5.0	3.8	4.0	8.8	10.6	7.2	6.6	7.7	6.2	4.6	3.6	3.1	5.3	6.4	6.6	6.2	4.6	4.6	4.2	3.7	3.0	4.0	6.0	6.5	6.2	6.2	5.1	8.9
4.5	4.2	4.3	4.9	5.0	4.5	5.1	4.8	4.5	4.2	4.9	6.4	5.8	6.0	6.1	5.9	5.4	5.8	5.5	4.9	4.7	5.1	5.7	4.7	5.2	5.4	5.0	5.2	4.2	4.7	5.2	5.2	5.3	4.5	4.5	4.3
3.2	3.3	3.5	3.6	3.5	3.4	3.4	3.7	3.5	3.7	4.0	4.2	3.8	3.8	3.9	3.3	3.1	3.6	3.9	3.8	3.2	3.5	3.5	3.6	3.5	3.2	2.8	3.2	3.0	3.2	3.5	4.1	4.3	3.8	3.4	3.4
2.3	2.4	2.2	1.9	2.1	2.4	2.5	2.4	2.8	2.8	2.7	3.4	3.8	3.6	2.7	1.8	1.8	2.2	2.2	2.4	2.4	2.3	2.4	2.3	2.2	2.3	2.5	2.3	2.2	2.4	2.6	2.8	2.8	2.7	2.7	2.3
1.8	1.9	1.8	2.1	2.1	2.0	1.8	1.9	1.9	1.9	2.3	2.5	2.5	2.2	1.7	1.9	2.1	2.0	1.6	1.3	0.9	0.9	0.8	0.9	1.0	1.1	0.9	0.9	0.7	0.6	0.7	0.7	0.7	1.0	1.7	1.9
1.6	1.7	1.9	1.9	1.9	1.7	1.4	1.1	1.0	0.9	0.9	0.9	0.9	1.2	1.5	1.3	1.0	0.8	0.7	0.7	0.6	0.7	0.7	0.7	0.8	0.9	0.8	0.7	0.6	0.6	0.7	0.8	0.9	1.2	1.4	1.4

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations



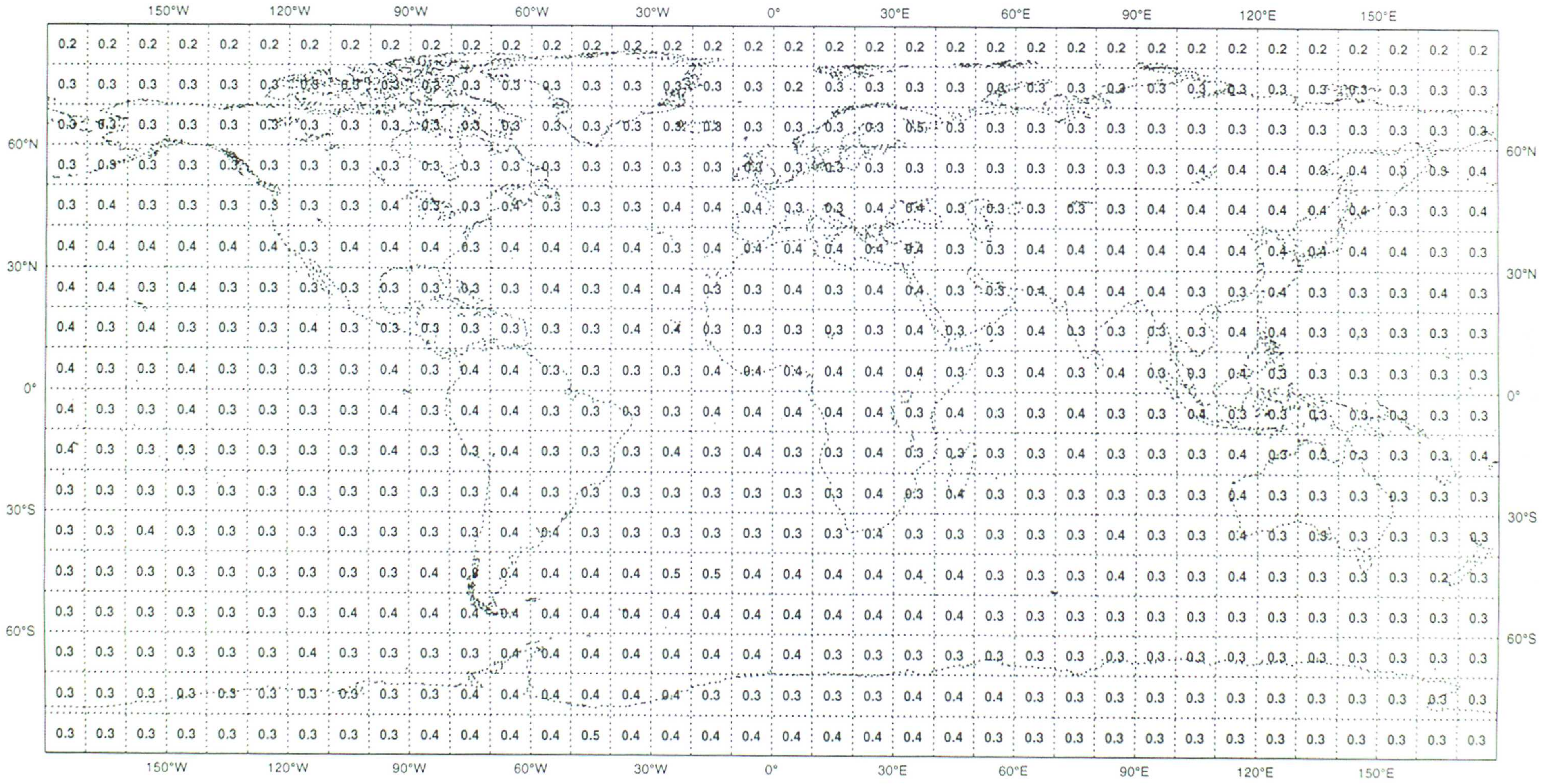
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.5	1.0	1.2	1.4	0.7	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.8	1.7	1.9	2.0	1.3	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.4	0.4	0.4	0.4
0.5	0.5	0.5	0.7	0.6	0.7	0.5	0.4	0.4	0.5	0.6	0.6	0.6	1.9	1.3	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.6	0.6	0.5	0.5
0.4	0.5	0.6	0.5	0.6	0.7	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.8	0.6	0.5	0.6	0.5	0.5	0.5	0.4
0.4	0.4	0.4	0.4	0.4	0.5	0.7	0.8	0.4	0.6	0.4	0.5	0.5	0.4	0.4	0.4	0.3	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	1.1	0.9	1.0	0.7	0.6	0.5	0.5	0.6	0.4	0.4	0.4
0.4	0.4	0.4	0.4	0.3	0.4	0.7	0.8	0.4	0.6	0.7	0.4	0.4	0.5	0.4	0.3	0.3	0.6	0.5	0.5	0.6	0.7	0.8	1.0	0.9	1.8	2.2	1.9	0.9	0.7	0.6	0.6	0.5	0.5	0.5	0.4
0.3	0.3	0.2	0.3	0.2	0.2	0.4	0.7	0.5	0.6	0.5	0.3	0.3	0.4	0.3	0.3	0.4	0.5	0.4	0.6	1.1	0.8	0.8	0.8	0.6	0.6	0.9	0.9	0.7	0.5	0.4	0.4	0.5	0.5	0.6	0.3
0.5	0.4	0.3	0.3	0.3	0.3	0.7	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.5	0.6	0.5	0.6	0.8	0.9	0.9	0.5	0.3	0.5	0.6	0.6	0.5	0.5	0.9	0.4	0.4	0.3	0.3	0.4
0.7	0.8	0.7	0.7	0.6	0.5	0.4	0.4	0.5	0.6	0.9	0.8	0.8	0.4	0.5	0.6	0.6	0.5	0.7	0.9	1.1	1.1	0.8	0.4	0.3	0.6	0.7	0.8	0.9	0.7	0.6	0.4	0.3	0.5	0.5	0.4
0.5	0.4	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.9	1.1	0.9	1.0	0.4	0.2	0.2	0.3	0.4	0.8	1.2	1.0	0.4	0.5	0.7	0.6	0.6	0.7	0.8	0.7	0.5	0.9	0.8	0.6	0.6	0.7
0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	1.0	1.3	1.0	1.1	0.4	0.2	0.2	0.3	0.2	1.1	1.1	0.8	0.6	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.6	0.8	0.5	0.4	0.5	0.6
0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.2	0.4	1.6	1.4	0.9	0.4	0.4	0.2	0.2	0.3	0.9	1.0	0.8	0.5	0.4	0.2	0.2	0.2	0.3	0.3	1.0	1.1	0.9	0.6	0.4	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.7	1.1	0.9	0.4	0.4	0.4	0.3	0.3	0.3	0.5	0.7	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.6	0.6	0.7	0.8	0.5	0.3	0.4
0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.7	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.3	0.5	0.5
0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4
0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.7	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.7	1.1	0.8	0.6	0.9	1.1	1.2	0.9	0.8	0.9	0.8	0.6	0.5	0.5
0.7	0.6	0.7	0.7	1.0	1.2	1.1	0.9	1.0	0.9	0.8	0.8	0.7	0.7	0.7	1.0	1.6	2.4	2.8	3.2	3.2	3.2	2.9	2.3	2.3	2.3	2.6	3.0	2.6	2.4	2.1	1.6	1.4	1.4	1.0	0.7
0.9	0.8	0.9	1.1	1.2	1.0	1.1	1.4	1.2	0.8	0.7	0.7	0.7	0.8	0.8	1.0	1.0	1.1	1.4	1.6	1.7	1.9	2.2	2.2	2.4	2.6	2.5	2.3	1.8	1.5	1.4	1.4	1.4	1.5	1.1	1.0

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations



0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4
0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4
0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5

Figure 54. ATOVS SD O-B brightness temperature differences (deg C). NOVEMBER 2002
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations



0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.4
0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3
0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3
0.4	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3
0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3
0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	[illegible]	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.3
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: November 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the wind observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
12517	36.4	-2.8	P	453	0	3	0.8	-0.1	0.8
41503	18.3	-51.8	P	564	0	2	0.7	-0.5	0.8
41522	17.2	-48.5	P	560	0	1	0.6	0.0	0.6
41531	28.1	-74.8	P	583	0	1	0.6	0.6	0.9
41532	26.2	-68.8	P	612	0	1	0.6	0.2	0.7
41533	28.9	-77.6	P	592	0	2	0.6	-0.8	1.0
41534	26.2	-69.1	P	613	0	2	0.6	0.4	0.7
41536	20.2	-71.3	P	607	84	87	5.5	3.5	6.5
41537	25.6	-72.7	P	605	0	3	0.7	0.6	1.0
41561	15.8	-70.2	P	427	0	1	0.6	-1.2	1.3
41577	34.6	-76.5	P	627	0	1	0.6	-0.1	0.6
41640	39.6	-37.5	P	615	0	1	0.9	2.2	2.4
41645	25.3	-74.7	P	567	0	21	0.5	-0.4	0.7
41647	26.0	-65.4	P	581	0	2	0.6	-0.5	0.8
41648	26.8	-72.4	P	583	0	2	0.6	-0.3	0.6
41649	13.5	-54.6	P	529	0	1	0.8	-0.9	1.2
41650	26.5	-65.4	P	599	0	2	0.5	0.3	0.6
41652	27.3	-65.0	P	563	0	1	0.5	0.0	0.5
41658	37.0	-54.7	P	613	0	1	1.0	-1.1	1.5
41659	34.9	-26.5	P	618	0	2	0.7	0.5	0.9
41666	34.0	-51.1	P	628	0	2	0.6	0.0	0.6
44504	50.8	-41.1	P	483	61	91	8.4	0.1	8.4
44511	42.0	-33.9	P	350	5	36	4.4	-1.0	4.5
44549	56.3	-19.3	P	1917	0	64	0.9	-0.8	1.2
44550	56.3	-16.1	P	1716	0	63	1.4	0.1	1.4
44601	36.0	-46.0	P	707	2	5	0.8	-0.2	0.9
44602	44.3	-45.0	P	6	83	100	0.0	5.1	5.1
44606	32.3	-53.2	P	802	0	16	0.9	0.2	0.9
44607	41.4	-41.6	P	824	0	19	1.4	0.0	1.4
44608	38.4	-40.1	P	874	0	24	1.2	0.6	1.3
44609	50.8	-33.0	P	1067	1	40	1.8	-0.6	1.9
44610	44.5	-50.8	P	966	0	32	1.4	-0.6	1.6
44611	50.8	-47.8	P	759	1	14	1.7	0.0	1.7
44616	41.2	-17.2	P	678	0	0	0.6	-0.5	0.8
44624	39.4	-14.0	P	86	23	99	1.8	-9.8	10.0
44625	30.6	-20.6	P	1007	0	33	0.5	-0.2	0.5
44627	37.4	-20.6	P	629	0	0	0.6	-0.6	0.9
44721	31.8	-49.0	P	687	0	1	0.6	-0.3	0.7
44723	44.3	-21.5	P	658	0	2	1.3	0.4	1.3
44726	57.6	-38.3	P	1390	0	51	1.3	0.2	1.3
44730	61.5	-16.8	P	1350	0	49	1.0	-0.2	1.1
44763	42.5	-19.0	P	682	0	0	0.7	0.0	0.7
44764	54.2	-24.8	P	754	0	14	1.7	-0.1	1.7
44767	50.6	-27.7	P	689	0	12	1.4	-0.1	1.4
44769	56.4	-34.1	P	803	0	15	1.0	-0.3	1.1
44772	61.2	-32.2	P	647	0	0	0.8	-0.6	1.0
44773	44.9	-28.7	P	652	1	3	1.6	0.8	1.8
44780	60.3	-25.2	P	558	0	42	0.9	0.0	0.9
47554	73.1	-76.3	P	567	0	34	0.9	0.1	0.9
62501	30.1	-38.4	P	676	0	0	0.6	0.2	0.6
62502	52.0	-21.3	P	215	0	0	1.0	-0.4	1.1
62503	30.6	-40.8	P	686	0	0	0.6	-0.6	0.9
62505	52.9	-31.9	P	758	1	14	1.6	-0.2	1.6
62507	50.9	-13.2	P	747	0	11	1.0	-0.5	1.2
62508	45.7	-13.0	P	654	0	2	1.5	0.1	1.5
62509	55.7	-16.5	P	632	1	5	1.5	0.7	1.7
62512	40.4	-12.6	P	854	0	26	1.2	0.7	1.4
62513	36.1	-30.2	P	675	0	1	1.1	0.5	1.2
62514	35.8	-34.7	P	1098	0	43	0.8	0.1	0.8
62515	32.2	-23.4	P	679	0	0	0.7	0.1	0.7

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
62517	32.8	-27.6	P	660	0	0	0.6	-0.3	0.7
62519	43.5	-9.3	P	639	1	3	1.4	0.7	1.6
62696	56.9	-23.1	P	1266	0	48	1.3	-0.2	1.4
62711	63.2	-33.0	P	1011	0	39	1.0	0.2	1.0
62712	59.7	-33.8	P	783	0	17	1.3	0.4	1.3
64553	61.8	-21.5	P	703	0	44	1.0	-0.5	1.1
64606	64.9	-33.5	P	16	0	0	1.1	0.3	1.1
65518	64.9	-33.0	P	33	0	0	0.6	0.4	0.7
WIND SPEED									
41503	18.3	-51.8	SPEED	561	0	100	1.4	-0.5	1.5
41522	17.2	-48.5	SPEED	558	0	100	1.7	-0.1	1.7
41531	28.1	-74.8	SPEED	581	0	100	2.7	0.7	2.8
41532	26.2	-68.8	SPEED	605	0	100	1.8	0.3	1.9
41533	28.9	-77.6	SPEED	586	0	100	2.2	0.9	2.4
41534	26.2	-69.1	SPEED	608	0	100	1.9	0.5	2.0
41536	20.2	-71.3	SPEED	526	5	100	5.4	-1.5	5.6
41537	25.6	-72.7	SPEED	602	0	100	2.5	0.3	2.5
41561	15.8	-70.2	SPEED	427	0	100	2.4	0.5	2.5
41647	26.0	-65.4	SPEED	579	0	100	2.0	0.7	2.1
41648	26.8	-72.4	SPEED	583	1	100	2.3	1.4	2.7
41649	13.5	-54.6	SPEED	526	0	100	1.6	0.2	1.6
41652	27.3	-65.0	SPEED	15	33	100	4.7	13.2	14.0
44601	36.0	-46.0	SPEED	683	2	100	3.4	-0.3	3.4
44602	44.3	-45.0	SPEED	687	3	100	3.6	1.0	3.7
62502	52.0	-21.3	SPEED	214	0	100	3.4	1.1	3.5
62711	63.2	-33.0	SPEED	1011	0	100	2.8	1.0	3.0
WIND DIRECTION									
41503	18.3	-51.8	DIRN.	379	0	0	11.3	9.7	14.9
41522	17.2	-48.5	DIRN.	465	0	0	12.4	-3.2	12.8
41531	28.1	-74.8	DIRN.	356	1	0	19.3	0.9	19.3
41532	26.2	-68.8	DIRN.	404	1	0	16.0	18.2	24.3
41533	28.9	-77.6	DIRN.	323	0	0	17.7	1.9	17.8
41534	26.2	-69.1	DIRN.	394	0	0	16.8	18.6	25.0
41536	20.2	-71.3	DIRN.	88	30	0	38.3	77.4	86.3
41537	25.6	-72.7	DIRN.	392	0	0	18.6	-12.9	22.6
41561	15.8	-70.2	DIRN.	391	0	0	13.6	-21.0	25.1
41647	26.0	-65.4	DIRN.	336	1	0	19.5	0.7	19.5
41648	26.8	-72.4	DIRN.	414	1	0	34.0	55.3	65.0
41649	13.5	-54.6	DIRN.	497	0	0	11.9	-14.3	18.6
41652	27.3	-65.0	DIRN.	15	33	0	11.8	4.4	12.5
44601	36.0	-46.0	DIRN.	444	2	0	21.5	0.2	21.5
44602	44.3	-45.0	DIRN.	587	4	0	26.1	14.6	29.9
62502	52.0	-21.3	DIRN.	203	0	0	17.8	-22.4	28.6
62711	63.2	-33.0	DIRN.	851	0	0	13.7	-2.7	14.0

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: November 2002

Monitoring procedures:

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored :N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

		TEMPERATURE				WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	445	1	5	1.6	0.1	365	1	9	0	10.6	0.3
ACA	1182	1	3	1.5	-0.3	1132	0	2	0	7.0	0.3
AEA	173	1	2	1.7	0.4	55	0	2	0	6.6	0.0
AEL	230	1	12	1.6	-0.5	182	1	13	0	9.2	-0.8
AFL	287	1	6	2.1	0.5	273	0	3	0	7.5	0.6
AFR	932	0	8	1.5	0.4	789	1	9	0	8.2	-0.2
AIS	161	0	12	1.8	-0.7	146	1	13	0	7.2	0.8
AJM	258	0	3	1.5	-0.2	217	0	4	0	8.6	0.6
AMM	64	0	5	1.5	0.5	36	0	8	0	8.3	0.4
AMX	198	2	3	1.4	0.0	130	0	8	0	12.6	-0.8
AZA	354	1	21	2.8	0.7	335	0	4	0	8.7	0.3
BAL	112	0	11	1.9	-0.1	90	3	20	0	10.2	-0.3
BAW	461	0	6	1.6	-0.6	453	0	7	0	7.1	0.3
BSK	25	0	4	2.0	0.6	25	0	8	0	11.6	2.6
BWA	76	0	11	1.4	-0.1	51	0	12	0	7.0	0.5
CFG	428	1	5	1.7	-0.7	358	0	6	0	7.8	-0.2
CGA	60	0	0	1.4	-0.5	55	0	0	0	5.4	1.0
CGH	81	0	2	1.1	-0.4	74	0	3	0	3.9	0.4
CLX	248	0	2	1.5	-0.5	234	0	3	0	6.8	-0.2
COA	148	1	20	1.5	-0.1	89	0	22	0	6.7	1.6
CRL	116	0	2	1.4	0.1	83	0	2	0	6.5	0.3
CUB	146	1	18	2.4	1.2	107	0	8	0	8.6	0.5
DAB	152	0	8	1.3	-0.3	140	0	9	0	4.7	0.4
DAI	120	0	1	1.3	-0.1	116	0	1	0	5.0	0.4
DAL	781	0	15	1.7	-0.5	711	1	16	0	8.7	0.1
DBR	41	2	7	2.1	-0.1	41	0	2	0	7.4	1.0
DCE	48	0	10	1.0	0.2	39	0	13	0	6.4	1.2
DCS	32	0	3	2.0	0.1	35	0	0	0	7.7	1.6
DHL	109	2	100	6.7	-6.1	104	1	21	0	12.7	3.3
DLH	859	0	13	1.4	0.1	838	0	13	0	7.5	0.5
EDW	39	3	5	1.0	-0.2	36	0	8	0	12.6	-2.5
EIA	129	2	40	4.1	2.2	128	1	100	0	18.4	6.7
ELY	173	1	3	1.6	-0.2	155	1	5	0	7.4	0.6
ETH	20	0	5	1.3	-0.1	23	0	9	0	9.8	0.1
EWW	59	0	7	1.8	0.3	60	0	7	0	9.9	-0.2
FDX	799	0	37	1.5	0.2	798	0	37	0	8.1	0.2
FGS	149	0	1	1.3	0.4	140	0	1	0	4.4	0.4
FGZ	44	0	0	1.3	-0.2	43	0	0	0	5.1	0.2
FIN	211	0	5	1.5	0.2	193	1	6	0	10.2	0.5
GCO	284	0	6	1.6	-0.1	282	0	12	0	10.9	1.8
GOJ	33	0	0	1.2	0.0	33	0	0	0	5.3	1.9
GRL	42	0	0	1.7	-0.4	41	0	0	0	4.0	0.4
GTI	212	0	13	1.7	0.0	209	1	14	0	7.8	0.0
GVF	27	0	0	1.0	-0.3	24	0	0	0	4.9	0.9
GVG	20	0	0	1.2	0.0	20	0	0	0	5.3	0.3
GVH	24	0	0	1.1	-0.5	23	0	0	0	6.1	2.4
GVL	22	0	0	1.2	0.1	20	0	0	0	5.4	0.0
GVR	68	0	1	1.3	0.1	60	0	0	0	5.6	-0.5
GWW	63	0	2	1.5	-0.7	55	0	0	0	5.0	1.3
IBE	919	0	5	1.6	0.5	480	1	9	0	8.1	0.6
ICE	657	0	3	1.5	-0.3	630	0	3	0	7.4	0.8
IWD	67	0	1	1.2	-0.3	21	0	10	0	10.3	3.3
JAL	23	0	9	1.5	0.1	21	0	14	0	8.1	-0.2
JMC	47	0	4	1.5	0.6	39	0	8	0	6.6	2.0
KLM	1030	0	4	1.7	0.0	900	0	5	0	7.5	0.3
LAN	27	0	7	0.9	0.1	24	0	13	0	9.4	0.7
LDI	216	0	11	1.6	-0.6	162	0	2	0	6.3	0.2
LIB	160	1	6	1.6	1.1	97	0	10	0	11.4	1.1
LOT	49	0	0	1.3	-0.8	49	0	0	0	5.4	0.2

	TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
LTU	418	0	7	1.6	-0.1	333	0	8	0	8.0	0.9
MAS	24	0	0	1.7	0.8	23	0	9	0	15.3	1.7
MON	40	0	10	2.3	-0.4	34	0	6	0	8.5	0.8
MPD	104	1	4	1.8	0.9	54	2	4	0	8.5	-1.2
MPH	392	0	2	1.7	-0.7	367	0	3	0	8.5	-0.5
MYT	97	1	4	1.6	0.0	85	0	4	0	8.3	-0.6
NCA	21	0	0	1.3	0.6	20	0	0	0	5.5	-1.1
NWA	3142	1	3	1.6	0.3	3107	0	3	0	7.0	0.4
PAC	287	1	11	2.3	0.1	284	0	9	0	8.8	0.2
RAM	143	1	7	1.9	0.2	76	3	9	0	11.5	-0.5
RCH	234	1	100	2.5	0.0	204	1	87	0	14.2	2.5
RJA	65	0	2	1.5	-0.4	66	0	3	0	6.6	1.1
RRR	75	0	19	2.6	0.8	69	0	22	0	11.7	1.0
RZO	54	0	7	1.4	-0.3	38	0	13	0	10.5	-1.0
SHE	20	0	0	1.6	1.3	20	0	0	0	7.2	1.0
SLR	109	2	12	1.4	0.1	99	0	10	0	7.2	-0.1
SVA	40	0	3	1.1	-0.3	42	5	12	0	12.2	0.2
TAG	34	0	0	1.2	0.2	30	0	3	0	10.1	-0.4
TAP	220	1	6	1.5	-0.4	106	1	9	0	8.7	0.5
TPA	29	0	0	1.2	0.6	23	4	4	0	6.4	-1.6
TSC	29	0	7	2.2	0.1	25	0	0	0	5.3	1.1
UAL	437	0	76	2.0	-1.1	433	0	80	0	9.1	0.9
UPS	1018	0	44	2.3	0.6	954	0	42	0	8.6	-0.1
USA	177	0	2	1.4	-0.1	154	1	3	0	8.6	0.8
VIR	205	0	3	1.5	-0.1	203	0	3	0	6.9	0.5
WOA	85	2	19	2.7	-0.6	83	1	22	0	12.1	0.8
9VS	100	0	4	1.3	0.1	98	0	3	0	5.7	-0.2
EU	26336	0	21	1.3	0.0	26336	0	21	0	5.1	0.5
KL	989	0	15	1.3	0.4	990	0	15	0	5.5	0.7
LH	321	0	9	1.8	1.2	320	0	8	0	4.8	1.0
TN	37	0	16	1.8	0.6	37	0	19	0	10.8	1.4
N	1481	1	11	1.5	0.1	1409	0	11	0	6.0	1.0
US ACARS	39115	5	44	1.5	0.2	39114	0	39	0	5.5	0.5

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: November 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :100 hPa.

Element monitored :GEOPOTENTIAL HEIGHT in metres

Parameters monitored :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	7	0	18.8	23.6	14.3
DBBH	12	Z	100	16	0	16.8	24.0	17.2
DBLK	12	Z	100	9	0	14.1	22.8	17.9
ELML7	00	Z	100	19	0	15.3	24.6	19.3
ELML7	12	Z	100	15	0	9.8	34.8	33.4
FNOR	00	Z	100	9	0	22.9	28.2	-16.3
FNOR	12	Z	100	9	1	11.2	16.4	-11.9
FNOU	12	Z	100	5	0	19.1	22.0	-10.8
FNPH	00	Z	100	1	0	0.0	16.0	-16.0
FNPH	12	Z	100	3	0	15.8	17.5	-7.3
FNRS	00	Z	100	8	0	25.9	32.7	-20.0
FNRS	12	Z	100	8	1	13.9	14.2	3.3
LDWR	00	Z	100	29	0	8.6	29.0	-27.7
LDWR	12	Z	100	27	1	11.7	26.4	-23.6
OVYA2	00	Z	100	1	0	0.0	28.0	-28.0
OVYA2	12	Z	100	2	0	1.5	21.6	-21.5
OXYH2	00	Z	100	6	0	8.6	11.5	-7.7
OXYH2	12	Z	100	9	0	14.4	18.2	-11.1
TOULOUS	00	Z	100	18	0	14.6	21.5	15.7
TOULOUS	12	Z	100	17	0	17.5	21.0	11.6
V2XM	00	Z	100	2	0	3.0	3.0	0.0
V2XM	12	Z	100	2	0	49.5	53.2	-19.5
WPKD	00	Z	100	3	0	10.1	10.2	-1.3
WPKD	12	Z	100	4	0	7.5	29.2	28.3
ZCBP6	00	Z	100	4	0	21.9	22.6	5.5
ZCBP6	12	Z	100	7	0	35.4	38.1	14.1
03953	00	Z	100	29	0	20.3	20.4	-1.9
03953	12	Z	100	28	0	16.3	17.5	6.4
04018	00	Z	100	29	0	14.0	23.1	-18.4
04018	12	Z	100	27	0	16.8	17.0	-2.5
04220	00	Z	100	29	0	14.3	39.3	-36.6
04220	12	Z	100	29	0	9.9	31.0	-29.4
04270	00	Z	100	28	0	14.7	28.9	-24.8
04270	12	Z	100	27	0	23.8	33.1	-23.1
04339	00	Z	100	29	0	12.0	35.0	-32.9
04339	12	Z	100	28	0	10.1	25.8	-23.8
04360	00	Z	100	29	0	10.8	31.3	-29.4
04360	12	Z	100	29	0	15.5	33.5	-29.7
08001	00	Z	100	23	1	23.1	31.4	-21.3
08001	12	Z	100	27	1	26.5	30.9	-15.9
08508	00	Z	100	6	0	8.7	20.9	19.0
08508	12	Z	100	25	0	13.4	37.7	35.2
08522	00	Z	100	27	0	12.1	25.8	22.8
08522	12	Z	100	29	0	11.9	30.5	28.1
08594	12	Z	100	22	0	18.8	28.6	21.5
71600	00	Z	100	29	0	26.2	26.2	1.1
71600	12	Z	100	29	0	21.7	22.2	-4.5
72201	00	Z	100	29	0	18.2	27.3	20.4
72201	12	Z	100	29	0	15.8	25.0	19.4
72402	00	Z	100	28	0	28.8	31.1	11.5
72402	12	Z	100	28	1	24.3	29.3	16.4
74494	00	Z	100	22	0	19.0	19.0	1.5
74494	12	Z	100	29	0	30.5	30.6	-2.1
78016	00	Z	100	28	0	21.5	40.6	34.5
78016	12	Z	100	27	0	20.3	39.1	33.4

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: November 2002

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

```
 WMO   OBS              NUM     NUM
IDENT TIME ELM   LEV    OBS    GROSS       SD      RMS     BIAS

DBBH   00   Z    500     8       0        9.1      9.7      3.1
DBBH   12   Z    500    17       0       10.3     10.6      2.5
DBLK   12   Z    500     9       0        8.5     10.7      6.4
ELML7  00   Z    500    20       0       11.2     11.2      0.3
ELML7  12   Z    500    17       0        9.7     11.9      6.9

FNOR   00   Z    500     9       0        8.1     10.7     -7.0
FNOR   12   Z    500    10       1        9.5     10.1     -3.4
FNOU   12   Z    500     5       0        4.8      5.6     -3.0
FNPH   00   Z    500     2       0        5.0      5.1     -1.0
FNPH   12   Z    500     3       0        3.6      3.6      0.0

FNRS   00   Z    500     9       0       13.0     21.7    -17.3
FNRS   12   Z    500     8       1       14.1     14.1     -0.3
LDWR   00   Z    500    29       0       10.2     11.4      5.1
LDWR   12   Z    500    27       1       16.2     17.1      5.3
OVYA2  00   Z    500     2       0       12.5     15.7     -9.5

OVYA2  12   Z    500     2       0        8.0     16.1     14.0
OXYH2  00   Z    500     6       0        3.9      6.6      5.3
OXYH2  12   Z    500     9       0        9.3     12.8      8.8
TOULOUS00   Z    500    18       0        8.3      9.5      4.6
TOULOUS12   Z    500    17       1        8.9     10.8      6.1

V2XM   00   Z    500     3       0       10.1     17.8     14.7
V2XM   12   Z    500     2       0       24.0     32.6     22.0
WPKD   00   Z    500     9       1       12.6     13.3     -4.2
WPKD   12   Z    500     7       0       14.7     15.5      5.0
ZCBP6  00   Z    500     7       0       12.4     12.7      2.7

ZCBP6  12   Z    500     7       0       21.0     21.1      2.0
03953  00   Z    500    29       0       17.6     18.1      4.2
03953  12   Z    500    29       0       13.8     14.4      3.9
04018  00   Z    500    29       0       16.1     16.9      5.1
04018  12   Z    500    28       0       13.5     13.8      2.9

04220  00   Z    500    29       0        9.3      9.3      1.0
04220  12   Z    500    29       0       11.2     11.3      2.0
04270  00   Z    500    29       0       14.4     14.6      2.4
04270  12   Z    500    27       0       18.5     18.6      1.0
04339  00   Z    500    29       0        8.4      8.7      2.3

04339  12   Z    500    28       0        8.6     10.3      5.8
04360  00   Z    500    29       0       11.5     11.5     -0.2
04360  12   Z    500    29       0       11.4     11.4      0.0
08001  00   Z    500    25       2       12.2     18.5    -13.8
08001  12   Z    500    28       1       16.2     19.2    -10.3

08508  00   Z    500     6       0       10.1     11.3     -5.0
08508  12   Z    500    26       0       11.8     12.5      4.0
08522  00   Z    500    28       0       10.4     10.5     -1.4
08522  12   Z    500    29       0       10.8     14.3      9.3
08594  12   Z    500    22       0        6.9      9.7      6.9

71600  00   Z    500    29       0       16.8     17.8     -5.9
71600  12   Z    500    29       0       25.6     25.8     -3.1
72201  00   Z    500    29       0        6.4      6.4      0.1
72201  12   Z    500    29       0        7.3      7.4     -1.2
72402  00   Z    500    28       0       16.3     17.1     -5.0

72402  12   Z    500    29       0       23.5     24.9     -8.0
74494  00   Z    500    28       0       16.8     16.9     -2.4
74494  12   Z    500    29       0       24.8     25.4     -5.6
78016  00   Z    500    29       0       12.7     17.7     12.3
78016  12   Z    500    29       0       12.5     17.6     12.4
```

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: November 2002

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.2	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	7	0	0	7.8	-2.1	3.0
DBBH	12	V	100	15	0	0	6.1	0.2	-1.1
DBLK	12	V	100	9	0	0	6.2	0.0	0.7
ELML7	00	V	100	19	0	0	4.8	-0.2	-0.6
ELML7	12	V	100	12	0	0	4.4	-1.5	0.3
FNOR	00	V	100	9	0	0	4.8	0.9	-1.2
FNOR	12	V	100	8	0	0	3.8	-0.9	-0.5
FNOU	00	V	100	1	0	0	2.5	2.5	0.0
FNOU	12	V	100	4	0	0	6.1	2.9	2.1
FNPH	00	V	100	1	0	0	0.9	-0.9	-0.3
FNPH	12	V	100	3	0	0	7.6	2.4	-0.3
FNRS	00	V	100	9	0	0	4.3	-1.2	-0.4
FNRS	12	V	100	9	0	11	7.0	-3.4	2.3
LDWR	00	V	100	29	0	0	2.4	-0.2	0.0
LDWR	12	V	100	28	0	0	2.1	0.3	0.0
OVYA2	00	V	100	1	0	0	9.8	2.0	-9.6
OVYA2	12	V	100	2	0	0	5.7	1.2	-4.7
OXYH2	00	V	100	6	0	0	4.0	2.1	-1.5
OXYH2	12	V	100	8	0	12	9.6	1.8	-3.5
TOULOUS	00	V	100	18	0	0	4.7	0.8	-1.6
TOULOUS	12	V	100	17	0	0	3.8	0.6	0.8
V2XM	00	V	100	2	0	0	3.6	1.3	-0.8
V2XM	12	V	100	1	0	0	1.5	-1.2	1.0
WPKD	00	V	100	3	0	0	7.0	0.5	-5.2
WPKD	12	V	100	3	0	0	5.6	2.6	0.1
ZCBP6	00	V	100	3	0	0	4.1	0.9	0.5
ZCBP6	12	V	100	3	0	0	3.5	1.3	0.8
03953	00	V	100	29	0	0	4.4	1.1	-0.8
03953	12	V	100	28	0	0	3.2	0.2	-0.1
04018	00	V	100	29	0	0	3.2	0.7	0.0
04018	12	V	100	27	0	0	3.2	0.7	0.0
04220	00	V	100	29	0	0	3.0	-0.5	0.3
04220	12	V	100	29	0	0	2.6	-0.2	-0.1
04270	00	V	100	28	0	0	3.4	-0.8	0.8
04270	12	V	100	27	0	0	3.5	0.2	-0.6
04339	00	V	100	21	0	0	5.1	1.3	-0.8
04339	12	V	100	28	0	0	4.7	1.8	-0.4
04360	00	V	100	29	0	0	3.5	0.0	1.1
04360	12	V	100	29	0	0	3.1	-0.7	0.5
08001	00	V	100	23	0	0	4.8	1.2	-0.4
08001	12	V	100	27	0	0	4.6	0.6	-0.4
08508	00	V	100	3	0	0	2.4	-1.7	1.3
08508	12	V	100	13	0	0	5.4	1.5	1.4
08522	00	V	100	24	0	0	5.6	0.3	-0.5
08522	12	V	100	29	0	0	4.9	0.6	1.3
08594	12	V	100	23	0	100	6.1	-2.4	2.7
71600	00	V	100	29	0	0	4.7	0.7	1.4
71600	12	V	100	29	0	0	5.4	-0.7	0.3
72201	00	V	100	29	0	0	4.3	0.5	1.5
72201	12	V	100	29	0	0	3.1	0.5	0.2
72402	00	V	100	28	0	0	4.3	1.6	0.4
72402	12	V	100	29	0	0	4.9	1.3	0.3
74494	00	V	100	22	0	4	7.0	0.0	2.6
74494	12	V	100	26	0	3	4.9	-1.0	1.7
78016	00	V	100	28	0	0	5.6	-1.6	1.1
78016	12	V	100	26	0	0	5.9	-0.3	0.0

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: November 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	500	7	0	0	2.9	-0.6	0.5
DBBH	12	V	500	16	0	0	4.1	0.0	0.4
DBLK	12	V	500	9	0	0	2.4	-0.4	-0.5
ELML7	00	V	500	20	0	0	4.0	0.1	1.2
ELML7	12	V	500	13	0	0	4.9	1.9	0.0
FNOR	00	V	500	10	0	0	3.9	-0.4	0.3
FNOR	12	V	500	11	0	0	3.4	-1.2	1.6
FNOU	00	V	500	1	0	0	3.3	1.6	-2.9
FNOU	12	V	500	5	0	0	3.8	0.0	1.6
FNPH	00	V	500	2	0	0	5.4	1.0	-1.3
FNPH	12	V	500	3	0	0	5.0	1.6	0.7
FNRS	00	V	500	10	0	0	3.2	-0.5	-1.0
FNRS	12	V	500	10	0	0	4.1	-0.8	-0.5
LDWR	00	V	500	29	0	0	2.8	0.2	-0.3
LDWR	12	V	500	28	0	0	3.6	-0.8	-0.6
OVYA2	00	V	500	1	0	0	10.2	-6.8	7.6
OVYA2	12	V	500	2	0	0	7.5	3.6	-1.8
OXYH2	00	V	500	6	0	0	3.6	0.6	-0.8
OXYH2	12	V	500	9	0	22	12.1	4.7	-1.3
TOULOUS	00	V	500	18	0	0	3.9	0.0	-1.5
TOULOUS	12	V	500	17	0	0	3.5	-0.1	-1.1
V2XM	00	V	500	3	0	0	3.3	2.2	-2.2
V2XM	12	V	500	2	0	0	4.9	-3.1	0.3
WPKD	00	V	500	8	0	0	4.1	0.9	1.0
WPKD	12	V	500	6	0	0	5.2	2.1	-0.4
ZCBP6	00	V	500	6	0	0	4.8	1.7	-2.1
ZCBP6	12	V	500	5	0	0	4.5	0.3	1.6
03953	00	V	500	29	0	0	5.2	-0.5	0.0
03953	12	V	500	29	0	0	4.6	1.3	0.7
04018	00	V	500	29	0	0	4.9	0.3	0.7
04018	12	V	500	28	0	0	5.5	0.1	0.3
04220	00	V	500	29	0	0	3.4	0.2	-0.2
04220	12	V	500	29	0	0	3.9	0.5	0.7
04270	00	V	500	28	0	0	4.3	0.4	0.1
04270	12	V	500	27	0	0	4.3	0.7	-0.9
04339	00	V	500	23	0	4	7.1	1.2	-1.2
04339	12	V	500	27	0	3	6.8	1.0	-0.6
04360	00	V	500	29	0	0	5.0	-0.6	0.4
04360	12	V	500	28	0	0	4.4	0.1	-0.1
08001	00	V	500	26	0	0	5.8	-0.4	0.3
08001	12	V	500	26	0	0	5.2	1.5	0.3
08508	00	V	500	3	0	0	3.7	1.8	-0.5
08508	12	V	500	14	0	0	3.4	-0.3	-0.5
08522	00	V	500	28	0	0	4.7	-1.4	1.1
08522	12	V	500	29	0	0	3.9	-1.0	1.0
08594	12	V	500	23	0	100	4.0	-2.2	0.0
71600	00	V	500	29	0	0	3.9	0.3	0.5
71600	12	V	500	29	0	3	7.0	0.4	0.9
72201	00	V	500	29	0	0	3.3	0.1	0.0
72201	12	V	500	29	0	0	3.3	-0.2	0.0
72402	00	V	500	28	0	0	4.4	0.1	-1.0
72402	12	V	500	29	0	0	3.9	1.4	0.6
74494	00	V	500	28	0	0	3.9	-0.9	-0.7
74494	12	V	500	29	0	0	4.5	-1.1	0.2
78016	00	V	500	29	0	0	4.0	0.4	0.1
78016	12	V	500	29	0	0	3.3	0.2	-0.1

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45